

RENOVATE ARMORY WASHTENAW ARMORY

MICHIGAN ARMY NATIONAL GUARD
7400 SOUTH HURON RIVER DRIVE
YPSILANTI, MI 48197

DMVA PROJECT #: 26C8022016

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CONTRACT #: Y21456

STATE OF MICHIGAN

DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET



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ABBREVIATIONS

A.B.	ANCHOR BOLTS	D.J.	DOOR JAMB	LAM.	LAMINATE	RAD.	RADIUS
A.C.T.	ACOUSTICAL CEILING TILE	DN.	DOWN	LAV.	LAVATORY	R.C.P.	REFLECTED CEILING PLAN
ADDN.	ADDITIONAL	D.O.	DOOR OPENING	LB.	POUND	R	RISER
ADJ.	ADJACENT	DR.	DOOR	LEV.	LEVEL	R.D.	ROOF DRAIN
A.F.F.	ABOVE FINISHED FLOOR	D.S.	DOWN SPOUT	L.F.	LINEAR FEET	RTU	ROOF TOP UNIT
A.F.G.	ABOVE FINISHED GRADE	DWL.	DRAWING	LG.	LONG	REF.	REFERENCE
A.H.J.	AUTHORITY HAVING JURISDICTION	DWL.	DOWEL	LGTH.	LENGTH	REFL.	REFLECTED
A.H.U.	AIR HANDLING UNIT	EA.	EACH	L.H.	LOUVER HEAD	REIN.	REINFORCEMENT
ALT.	ALTERNATE	E.J.	EXPANSION JOINT	L.J.	LOUVER JAMB	REM.	REMOVABLE
ANCH.	ANCHOR	EL.	ELEVATION	LL.	LIVE LOAD	REQD.	REQUIRED
A.N.S.I.	AMERICAN NATIONAL STANDARDS INSTITUTE	ELEC.	ELECTRICAL	LLH	LONG LEG HORIZONTAL	R.R.	RAILROAD
A.P.	APPROXIMATE	EMB.	EMBEDMENT	LLV	LONG LEG VERTICAL	RM.	ROOM
APPROX.	APPROXIMATE	EQ.	EQUAL	L.O.	LOUVER OPENING	SCHED.	SCHEDULE
ARCH.	ARCHITECT, ARCHITECTURAL	EQUIP.	EQUIPMENT	L.P.	LOW POINT	SECT.	SECTION
A.S.T.M.	AMERICAN SOCIETY FOR TESTING MATERIALS	EQUIV.	EQUIVALENT	L.S.	LOUVER SILL	S.F.	SQUARE FEET
B.A.S.	BUILDING AUTOMATION SYSTEM	E.W.	EACH WAY	LVR.	LOUVER	SGL.	SINGLE
B/B	BACK TO BACK	EXP.	EXCAVATED	M	METER	SHT.	SHEET
B.C.	BOTTOM CHORD	EXP.B.	EXPANSION BOLT	MACH.	MACHINE	SIM.	SIMILAR
B.E.	BOTTOM ELEVATION	EXIST./(E)	EXISTING	MAINT.	MAINTENANCE	SP.	SPACE
BET.	BETWEEN	EXT.	EXTERIOR	MAS.	MASONRY	SPEC.	SPECIFICATIONS
B.F.	BARRIER FREE	F/F	FACE TO FACE	MAX.	MAXIMUM	SQ.	SQUARE
B.F.F.	BELOW FINISHED FLOOR	F.D.	FLOOR DRAIN	MCH.	MECHANICAL	S.S.	STAINLESS STEEL
BLDG.	BUILDING	FDN.	FOUNDATION	MET.	METAL	SSTL.	STRUCTURAL STEEL
BLK.	BLOCK	F.F.E.	FINISH FLOOR ELEVATION	MEZZ.	MEZZANINE	STAGG.	STAGGERED
BM.	BEAM	FIN.	FINISH, FINISHED	MFR.	MANUFACTURER	STD.	STANDARD
B.O.S.	BOTTOM OF STEEL	FL.	FLOOR	M.I.	MISCELLANEOUS IRON	STIFF.	STIFFENER
BOTT.	BOTTOM	F.S.	FAR SIDE	MIN.	MINIMUM	STL.	STEEL
BROG.	BRACING	FT.	FEET	MISC.	MISCELLANEOUS	STL. PL.	STEEL PLATE
BRG.	BEARING	FTG.	FOOTING	MM.	MILLIMETER	STRUCT.	STRUCTURAL
BRKT.	BRACKET	FUT.	FUTURE	M.O.	MASONRY OPENING	SUPP.	SUPPORT
BSMT.	BASEMENT	GA.	GAGE	M.R.A.C.T.	MOISTURE RESISTANT	SURF.	SURFACE
BULL.	BULLETIN	GALV.	GALVANIZED	M.T.	METRIC TON	SYM.	SYMMETRICAL
BULL.	BULLETIN	GEN.	GENERAL CONTRACTOR	N.I.C.	NOT IN CONTRACT	T	TREAD
C.	CHANNEL	NO.	NUMBER	NOM.	NOMINAL	T&B	TOP AND BOTTOM
C/C	CENTER TO CENTER	N.S.	NEAR SIDE	NOM.	NOMINAL	T.C.	TOP CHORD
CERT.	CERTIFIED	N.T.S.	NOT TO SCALE	N.S.	NEAR SIDE	T/E	TOP OF EAVE OR PARAPET STEEL
CHKD. PL.	CHECKED PLATE	O/O	OUT TO OUT	N.T.S.	NOT TO SCALE	TEMP.	TEMPERATURE, TEMPORARY
C.J.	CONSTRUCTION/CONTROL JOINT	O/O	OUTSIDE DIAMETER	O/O	OUT TO OUT	THD.	THREAD
C.L.	CENTER LINE	O.D.	OVERHEAD	O.D.	OUTSIDE DIAMETER	THK.	THICKNESS
CLG.	CEILING	OPNG.	OPENING	OPNG.	OPENING	T.L.	TOTAL LOAD
CLR.	CLEAR	OPP.	OPPOSITE	OPP.	OPPOSITE	T/M	TOP OF MASONRY
CM.	CENTIMETER	OPP. HD.	OPPOSITE HAND	OPP. HD.	OPPOSITE HAND	T.O.F.	TOP OF FOOTING
C.M.U.	CONCRETE MASONRY UNIT	P-LAM	PLASTIC LAMINATE	P-LAM	PLASTIC LAMINATE	T/STL.	TOP OF STEEL
CNVR.	CONVEYOR	PAR.	PARALLEL	PAR.	PARALLEL	T/S	TOP OF SLAB
COL.	COLUMN	PC	PIECE	PC	PIECE	TYP.	TYPICAL
CONN.	CONNECT/CONNECTION	P/C	PRECAST	P/C	PRECAST	U/S	UNDERSIDE
CONSTR.	CONSTRUCTION	P.C.F.	POUNDS PER CUBIC FOOT	P.C.F.	POUNDS PER CUBIC FOOT	U.N.O.	UNLESS NOTED OTHERWISE
CONT.	CONTINUATION/CONTINUOUS	PEN.	PENETRATION	PEN.	PENETRATION	VERT.	VERTICAL
CONTR.	CONTRACTOR	PH.	PHASE	PH.	PHASE	V.C.T.	VINYL COMPOSITE TILE
COVER	COVER	PL.	PLATE	PL.	PLATE	W/	WITH
CTR.	CENTER	PL.WD.	PLYWOOD	PL.WD.	PLYWOOD	W/O	WITHOUT
DEG.	DEGREE	PREFAB.	PREFABRICATION	PREFAB.	PREFABRICATION	WOOD	WOOD
DEMO	DEMOLITION	PROJ.	PROJECT, PROJECTION	PROJ.	PROJECT, PROJECTION	W.H.	WINDOW HEAD
DET.	DETAIL	P.S.F.	POUNDS PER SQUARE FOOT	P.S.F.	POUNDS PER SQUARE FOOT	W.J.	WINDOW JAMB
D.H.	DOOR HEADER	P.S.I.	POUNDS PER SQUARE INCH	P.S.I.	POUNDS PER SQUARE INCH	W.O.	WINDOW OPENING
DIA.	DIAMETER	PT.	POINT	PT.	POINT	WPT.	WORKING POINT
DIAG.	DIAGONAL	QTY.	QUANTITY	QTY.	QUANTITY	W.S.	WATER STOP
DIM.	DIMENSION					WT.	WEIGHT
						YD.	YARD
						ZC.	ZINC COATED

STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
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PROJECT: RENOVATE ARMORY WASHTENAW
DESIGNED: T. SCHEWITZ
DATE: 04/01/2022
ISSUED FOR: CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER: PROJECT: WASHTENAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.CAK
SHEET NUMBER: 1 OF 96
DRAWING TITLE: TITLE SHEET
G-001

DMVA PROJECT NO. 26C8022016

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APPLICABLE CODES

2015 MICHIGAN BUILDING CODE
2015 MICHIGAN MECHANICAL CODE
2017 NATIONAL ELECTRIC CODE + 2017 CONSTRUCTION CODE PART 8
2018 MICHIGAN PLUMBING CODE
2018 INTERNATIONAL FIRE CODE
2016 NFPA 72 NATIONAL FIRE ALARM CODE
2015 MICHIGAN ENERGY CODE
ABAS, AMERICANS WITH DISABILITIES ACT AND ARCHITECTURAL BARRIERS ACT ACCESSIBILITY STANDARDS, LATEST EDITION

DEFERRED SUBMITTALS

TO BE DESIGNED AND SUBMITTED BY GENERAL CONTRACTOR TO THE STATE OF MICHIGAN DEPARTMENT LICENSING AND REGULATORY AFFAIRS (LARA):

- FIRE ALARM SYSTEM
- FIRE SUPPRESSION SYSTEM
- FLAME SPREAD & SMOKE DEVELOPMENT OF ALL INTERIOR FINISHES

CONTRACTOR IS RESPONSIBLE FOR ALL FEES ASSOCIATED WITH LARA REVIEW AND TO ACCOUNT FOR A 3-MONTH REVIEW TIME.

SPECIAL INSPECTIONS

REFER TO STRUCTURAL DRAWINGS.

BUILDING DESCRIPTION

NUMBER OF STORIES: ONE STORY WITH A MECHANICAL MEZZANINE.
FUNCTION: STORAGE AREAS FOR SUPPLIES, PERSONAL EQUIPMENT AND VAULTS FOR SECURE STORAGE. THERE IS A DRILL HALL FOR TRAINING SOLDIERS. VEHICLES DRIVE INTO DRILL HALL ALTHOUGH NO VEHICLE REPAIR IS PERFORMED IN THE BUILDING. ADMINISTRATIVE SPACES INCLUDE OFFICES AND CLASSROOMS. FOOD STORAGE AND A KITCHEN IS PRESENT. ELECTRICAL IS LOCATED IN A CLOSET ON THE FIRST FLOOR. MECHANICAL IS LOCATED ON A MEZZANINE LEVEL. THERE IS A FIRE ALARM SYSTEM WITHIN THE BUILDING. FIRE SUPPRESSION IS PRESENT IN LIMITED AREAS.

AREA:

EXISTING BUILDING: 36,036 SQ.FT. GROSS
BUILDING ADDITION: 12,942 SQ.FT. GROSS - TOTAL OF WEST & FUTURE EAST ADDITION
TOTAL BUILDING: 48,978 SQ.FT. GROSS

TOTAL BUILDING HEIGHT:

23'-4" FROM GRADE TO TOP OF PARAPET.

ENERGY REQUIREMENTS:

MINIMUM R-VALUE REQUIREMENTS PER MEC 2015 TABLE C402.1.3

- ROOF: R-30
- WALLS ABOVE GRADE: R-11.4 (CONTINUOUS INSULATION)
- WALLS BELOW GRADE: R-7.5 (CONTINUOUS INSULATION)
- SLAB ON GRADE: R-10 FOR 24" BELOW

MAXIMUM U-FACTOR REQUIREMENTS PER MEC 2015 TABLES C402.1.4 AND C402.4

- ROOF: U-0.032
- WALLS ABOVE GRADE: U-0.090
- WALLS BELOW GRADE: U-0.119
- SLAB ON GRADE: F-0.54
- FIXED WINDOWS: U-0.38
- ENTRANCE DOORS: U-0.77

SHGC

- SOUTH, EAST, AND WEST ORIENTATION: 0.40
- NORTH ORIENTATION: 0.53

PROJECT DESCRIPTION

ADDITION TO ACCOMMODATE NEW VAULT, SUPPLY ROOM WEST AND A NEW PHYSICAL TRAINING AREA. RENOVATION OF EXISTING ARMORY TO EXPAND THE SHOWER AREA AND CREATE NEW JANITOR'S CLOSET + LACTATION ROOM. MILITARY AND PRIVATELY OWNED VEHICLE PARKING ARE EXPANDED TO THE NORTH AND WEST. NEW MILITARY PARKING ADDED BEHIND THE VEHICLE STORAGE BUILDING. A FUTURE ADDITION TO THE EAST IS PANNED TO ACCOMMODATE CLASSROOMS.

CONSTRUCTION OF BUILDING:

BUILDING STRUCTURE: MASONRY LOAD BEARING WALLS / METAL DECK ON STEEL JOISTS ROOF. STEEL BEAMS AND COLUMNS.
EXTERIOR WALL: 3-1/2" BRICK MASONRY OVER 8" CMU
SLAB THICKNESS: 4" SLAB
TYPE OF CONSTRUCTION: TYPE IIB

FIRE SPRINKLER SYSTEM WILL BE EXTENDED THROUGHOUT THE ENTIRE FACILITY

A FIRE ALARM SYSTEM IS PRESENT THROUGHOUT THE FACILITY

USE AND OCCUPANCY

303.4 ASSEMBLY (A-3)
304.1: BUSINESS (B)
311.2: STORAGE (S-1)

GENERAL BUILDING HEIGHT AND AREA

THE CALCULATIONS BELOW REPRESENT THE WEST AND EAST ADDITIONS. SEPARATED OCCUPANCIES PER TABLE 508.4 WERE USED BUT THE AREAS EXCEED THE ALLOWABLE BUILDING AREA.

WASHTENAW ARMORY: PERIMETER OF BUILDING: 1142 FEET
PERIMETER WITH OPEN SPACE: 1142 FEET
1142/1142=1 (GREATER THAN 25% SO ELIGIBLE FOR AREA INCREASE)

SUM OF AREA OF PUBLIC WAYS = 68,824 SF
68,824/1142 = 60.28 (30 IS THE MAX W)
EQ. 5-5: $(\frac{1142}{1142} - .25) * (30) = .75$

EQ. 5-1 IS PERFORMED WITH EACH OF THE THREE OCCUPANCIES WITHIN THE BUILDING (A-3, S-1, B)

A-3: 35,000+(9,500*.75)= 45,125 SF (ALLOWABLE AREA)
ACTUAL AREA = 7,357 SF

S-1: 70,000+(17,500*.75)= 83,125 SF (ALLOWABLE AREA)
ACTUAL AREA = 8,131 SF

B: 92,000+(23,000*.75)= 109,250 SF (ALLOWABLE AREA)
ACTUAL AREA = 33,490 SF

TO CALCULATE IF THE AREA INCREASE IS ALLOWED THE QUOTIENT OF EACH OCCUPANCY'S ACTUAL AREA AND ALLOWABLE AREA IS ADDED TOGETHER AND IF THE SUM IS LESS THAN 1, THE AREA INCREASE IS ALLOWED.

A-3: $\frac{7,357}{45,125} = 0.163$

S-1: $\frac{8,131}{83,125} = 0.098$

B: $\frac{33,490}{109,250} = 0.307$

+ 0.567: LESS THAN ONE SO AREA IS ALLOWED

PROJECT INFORMATION

JURISDICTION: DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS.

OCCUPIED BY A SINGLE TENANT AGENCY
MIXED USE BUILDING SEPARATED WITH FIRE BARRIERS PER TABLE 508.4.

EXISTING FIRST FLOOR	36,036 SF
WEST ADDITION	4,291 SF
(FUTURE) EAST ADDITION	8,651 SF
B BUSINESS USE	34,483' SF
STORAGE (S-1)	8,131' SF
A-3 ASSEMBLY	6,364' SF

SQUARE FOOTAGE OF ADDITION
TOTAL FIRST FLOOR AREA: 48,978' SF
TOTAL AREA OF ADDITION: 12,942' SF
PERCENTAGE OF ADDITION: 26%

OCCUPANCY CALCULATIONS PER DESIGN OCCUPANT LOAD PER MBC TABLE 1004.1.2
FIRST FLOOR:

BUSINESS: 34,483' SF/ 100 = 344 PEOPLE
STORAGE-1: 8,131' SF/ 300 = 27 PEOPLE
A-3 ASSEMBLY: 6,364' SF/ 15 = 424 PEOPLE = 299 MAX PER 1004.3

TOTAL DESIGN OCCUPANT LOAD: 670
ACTUAL OCCUPANT LOAD: 17 DAILY, 331 WEEKEND

OCCUPANT LOAD IN ASSEMBLY AREA SHALL BE LIMITED TO 299 AS ALLOWED BY BUILDING OFFICIAL PER 1004.1.2 WITH SIGNAGE POSTED PER 1004.3.

FIRE SUPPRESSION/SEPARATION

THERE IS CURRENTLY A COMPLETE FIRE ALARM SYSTEM. FIRE ALARM DEVICES WILL BE ADDED THROUGHOUT THE ADDITION IN ACCORDANCE WITH SECTION 907.2.1.

FIRE SUPPRESSION WILL BE EXTENDED THROUGHOUT THE FACILITY

INTERIOR FINISHES

ALL INTERIOR FINISH MATERIALS SHALL BE CLASS A: FLAME SPREAD 0-25; SMOKE DEVELOPED 0-450.

SEPARATION OF OCCUPANCIES PER TABLE 508.4

A3/B OR A3/S = 1 HOUR (W/SPRINKLERS)
BUSINESS // STORAGE 1 = NO SEPARATION REQUIREMENT
NO CORRIDOR RATING REQUIRED W/ SPRINKLERS PER TABLE 1020.1.

PLUMBING REQUIREMENTS

REQUIRED PLUMBING FIXTURES PER TABLE MPC 403.1 FOR MEN'S AND WOMEN'S TOILET ROOMS ON GROUND LEVEL.

FIXTURE COUNT IS BASED ON OCCUPANCY TYPE AND LOAD. REFER TO MPC 2018 SECTION 403.1.1 FOR FIXTURE COUNTS IN MULTIPLE OCCUPANCIES.
PER 331 OCCUPANT LOAD
(BASED ON 172 MEN AND 172 WOMEN)

	MEN		WOMEN	
BUSINESS 344 PEOPLE:	172	4.44 TOILETS REQUIRED 3.15 LAVATORIES REQUIRED	172	4.44 TOILETS REQUIRED 3.15 LAVATORIES REQUIRED
ASSEMBLY 299 PEOPLE:	150	1.2 TOILETS REQUIRED .75 LAVATORIES REQUIRED	150	2.3 TOILETS REQUIRED .75 LAVATORIES REQUIRED
STORAGE 27 PEOPLE:	14	.14 TOILETS REQUIRED .14 LAVATORIES REQUIRED	14	.14 TOILETS REQUIRED .14 LAVATORIES REQUIRED
		4.05 DRINKING FOUNTAIN (+4 DRINKING FOUNTAINS REQUIRED PER DESIGN OCCUPANT LOAD)		
SUM OF TOILETS AND LAVATORIES FROM EACH OCCUPANCY TYPE.		+ 5.78 TOILETS REQUIRED + 3.43 LAVATORIES REQUIRED		+ 6.88 TOILETS REQUIRED + 3.43 LAVATORIES REQUIRED
FIXTURES PROVIDED:		5 TOILETS 4 URINALS 6 LAVATORIES		9 TOILETS (SECTION 403.1.1) 6 LAVATORIES

UTILITIES

WATER, GAS, SANITARY SEWER AND STORM SEWER WILL REMAIN THE SAME.

EGRESS REQUIREMENTS

EGRESS WIDTH (PER SECTION 1005.1)
REQUIRED EXIT WIDTH PER OCCUPANT =0.2"
670 OCCUPANTS X 0.2" = 134" COMPLIES - FIVE EXITS PROVIDED TOTALING 216" EXIT WIDTH.

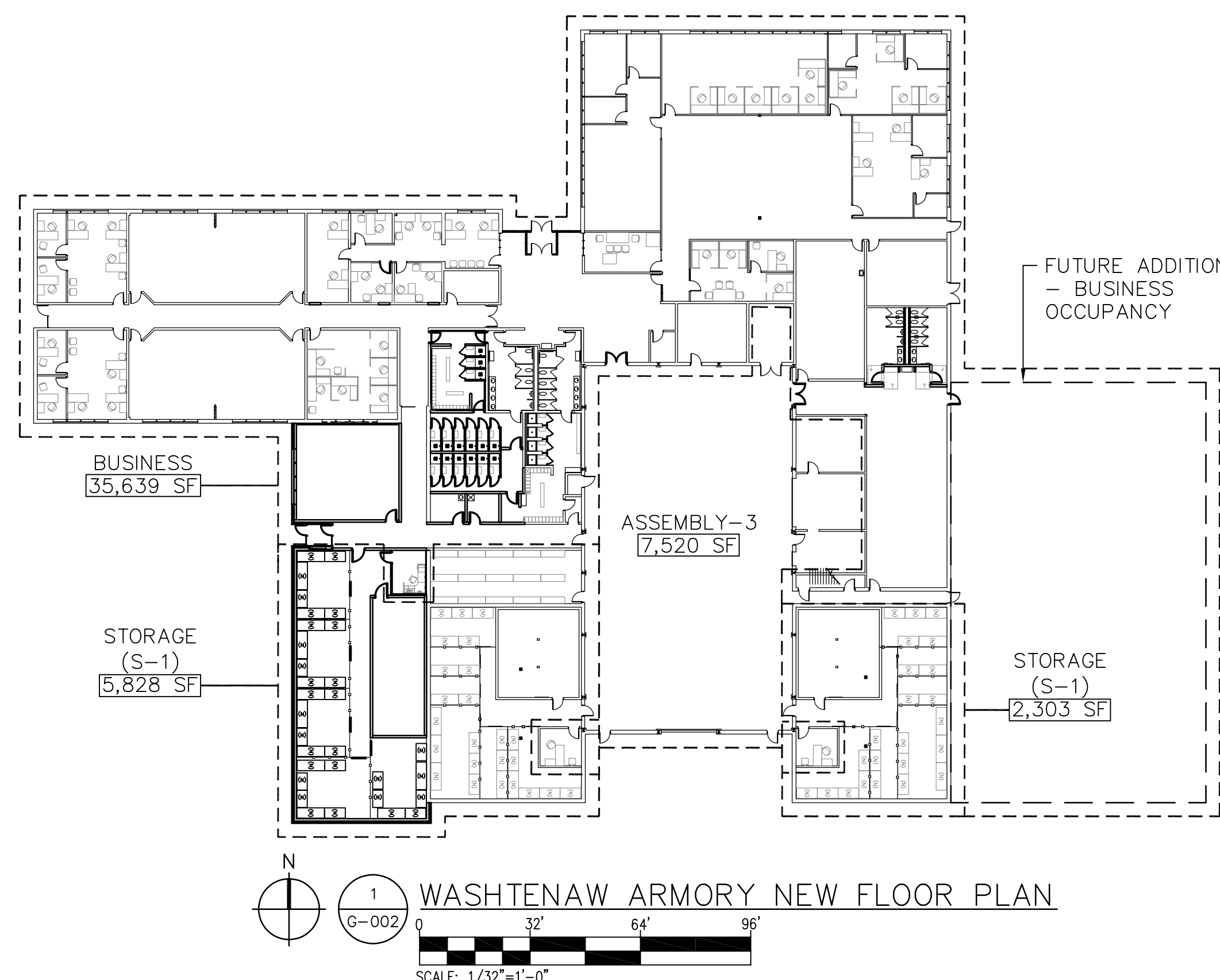
MINIMUM NUMBER OF EXITS:

(3) EXITS ARE REQUIRED PER MBC TABLE 1006.3.1 - COMPLIES - SEE SAFETY PLAN

MAXIMUM LENGTH OF EXIT ACCESS TRAVEL DISTANCE PER MBC TABLE 1017.2

S1/A = 250 FEET WITH SPRINKLERS
B = 300 FEET WITH SPRINKLERS

MAXIMUM LENGTH OF COMMON PATH OF TRAVEL DISTANCE IS 100 FEET (WITH SPRINKLERS) PER MBC 1006.2.1 - COMPLIES - SEE SAFETY PLAN
DEAD END CORRIDOR MAXIMUM LIMIT IS 50 FEET (WITH SPRINKLERS) PER MBC 1020.4 (WHEN 2 EXIT ARE REQUIRED) - COMPLIES - SEE SAFETY PLAN



1
G-002
WASHTENAW ARMORY NEW FLOOR PLAN
SCALE: 1/32"=1'-0"

STATE OF MICHIGAN
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PROJECT
RENOVATE ARMORY WASHTENAW
ARMORY

DESIGNED
DT
DRAWN
CHECKED TDS
APPROVED T. SCHERWITZ

DATE
04/01/2022

ISSUED FOR
CONSTRUCTION
DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTENAW ARMORY
CONTRACT NUMBER: 121456
FILE NO. 511/21326.CAK
DMA PROJECT NO. 268302016

SHEET NUMBER
2 OF 96

DRAWING TITLE
CODE REVIEW
SHEET

DRAWING NUMBER
G-002

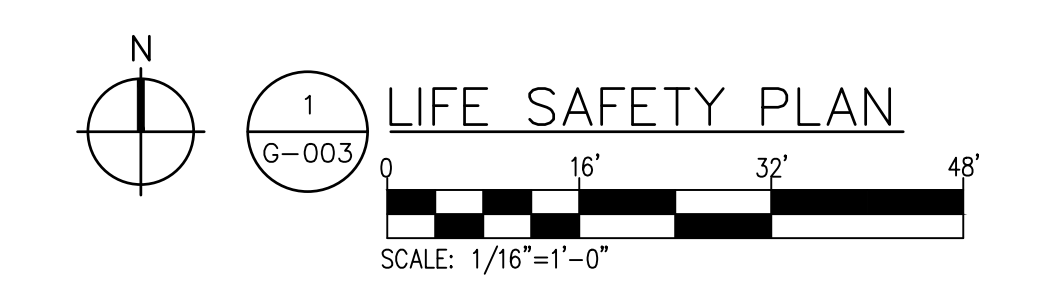
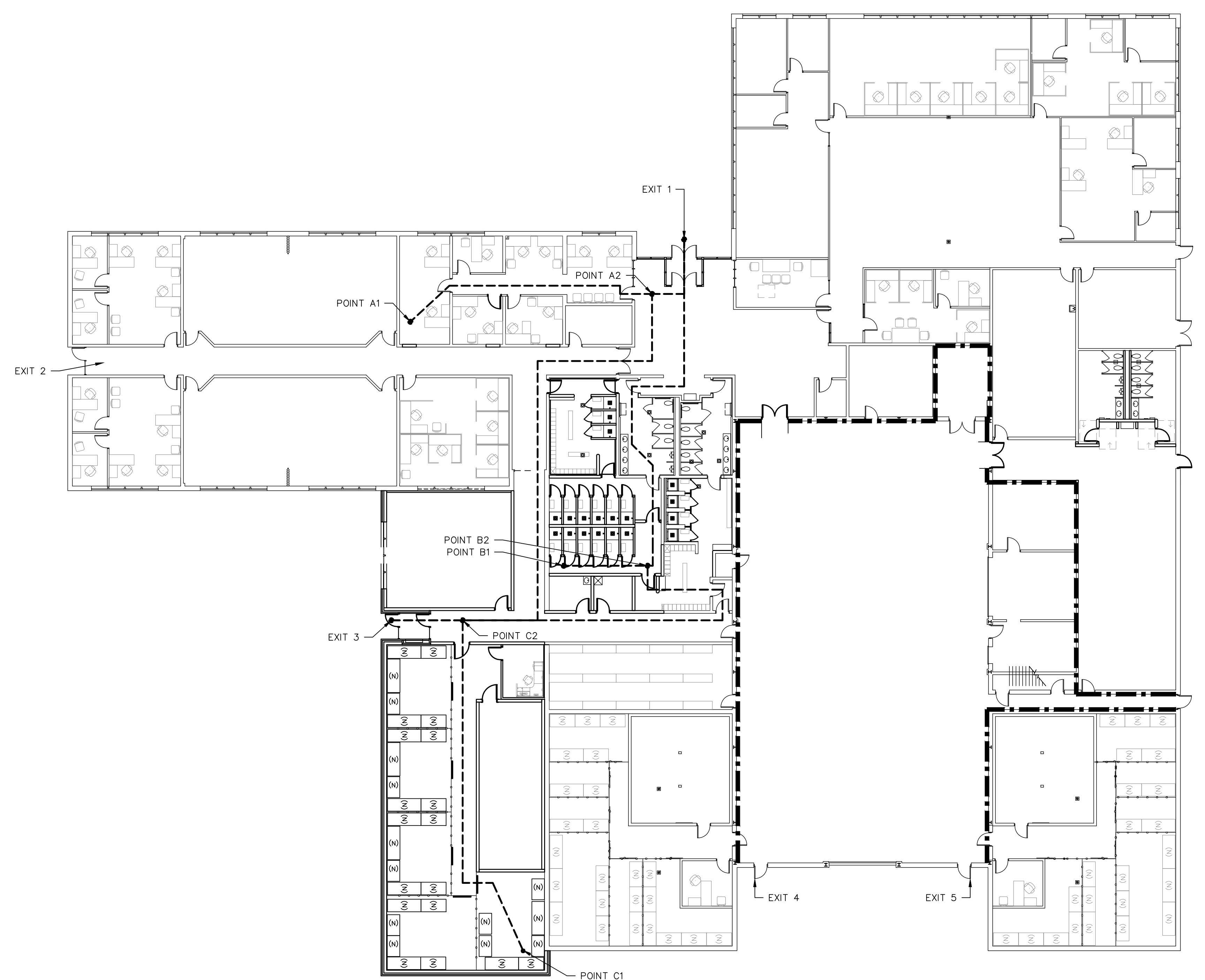


EXIT ACCESS:

POINT A1:	
TOTAL EXIT TRAVEL DISTANCE:	83' TO EXIT 1 (COMPLIES) 203' TO EXIT 3 (DOES NOT COMPLIES)
COMMON PATH OF TRAVEL TO POINT A2:	63' (COMPLIES)
POINT B1:	
TOTAL EXIT TRAVEL DISTANCE:	113' TO EXIT 1 (COMPLIES) 130' TO EXIT 3 (COMPLIES)
COMMON PATH OF TRAVEL TO POINT B2:	20' (COMPLIES)
POINT C1:	
TOTAL EXIT TRAVEL DISTANCE:	104' TO EXIT 3 (COMPLIES)
COMMON PATH OF TRAVEL TO POINT C2:	87' (COMPLIES)

LEGEND:

- NEW DOOR
- EXISTING DOOR
- NEW WALL
- EXISTING WALL
- PATH OF TRAVEL
- 1-HR FIRE BARRIER



LIFE SAFETY PLAN

LEGAL DESCRIPTION (AS PROVIDED)

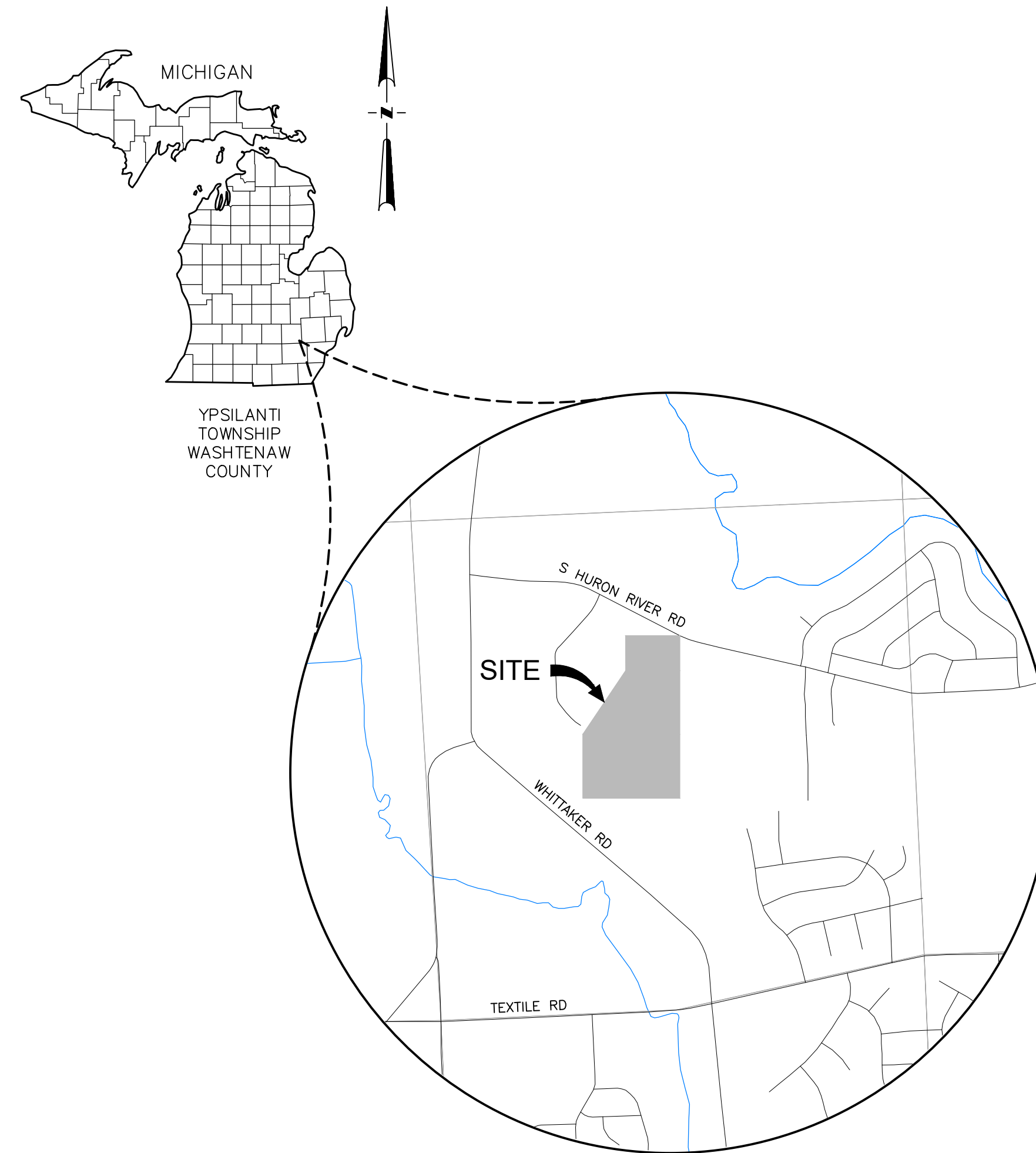
(PER

PARCEL TAX NUMBER: K -11-21-200-026

PARCEL 1:

YP#21-108-2C COM AT SE COR OF SEC, TH S 79-57-00 W 2380.98 FT IN S/L OF SEC, TH N 2-34-50 W 484.04 FT, TH N 22-36-25 W 245.98 FT, TH N 42-38-00 W 326.62 FT, TH N 46-11-00 W 814.59 FT, TH N 47-06-00 W 1005.84 FT, TH N 0-22-00 E 1028.88 FT, TH S 89-35-00 E 540.00 FT FOR POB, TH S 0-36-40 W 478.99 FT, TH S 89-23-20 E 792.59 FT, TH N 0-36-40 E 1221.62 FT, TH S 29-54-30 W 20.00 FT, TH N 60-08-30 W 125.00 FT, TH N 29-54-30 E 165.00 FT, TH N 60-08-30 W 203.85 FT, TH S 29-51-30 W 1180.20 FT TO POB, BEING PART OF W 1/2 SEC 21 T3S R7E 20.00 AC

PRELIMINARY SITE PLAN/CONSTRUCTION DRAWING FOR WASHTENAW ARMORY ADDITION

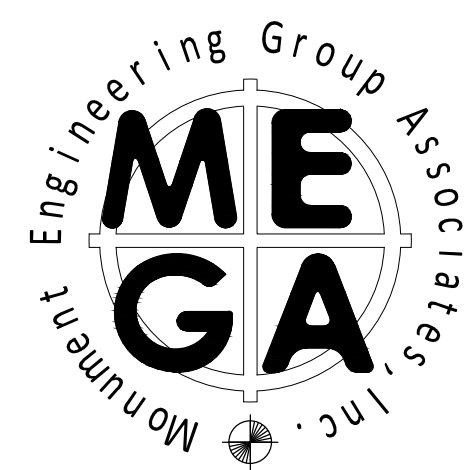


LOCATION MAP

BEARING REFERENCE

BEARINGS ARE BASED ON PROJECT COORDINATE SYSTEM:
MICHIGAN STATE PLANE COORDINATE SYSTEM, NAD83 (CONUS) (MOL) (GRS80), SOUTH ZONE 2113,
INTERNATIONAL FEET, GROUND
PROJECT LOCATION (LATITUDE): 42° 12' 11.62415"N
PROJECT LOCATION (LONGITUDE): -86° 36' 04.72723"W
PROJECT LOCATION (HEIGHT): 800.000
GROUND SCALE FACTOR: 1.00003817

DESIGN ENGINEER/SURVEYOR



MONUMENT ENGINEERING GROUP ASSOCIATES, INC

INNOVATIVE GEOSPATIAL &
ENGINEERING SOLUTIONS

298 VETERANS DRIVE,
FOWLERVILLE, MI 48836
ALLAN W PRUSS, PE, PS
PHONE: 517-223-3512

CLIENT



WASHTENAW ARMORY
7400 S HURON RIVER DR
YPSILANTI TWP, MI 48197
POC: JOSH BOYD
PHONE: 734-680-3026

ARCHITECT

G.H. FORBES ASSOCIATES ARCHITECTS
2800 WOODWARD
ROYAL OAK, MI 48067
POC: THERESA SCHERWITZ
PHONE: 248-542-7866



Allan W. Pruss

DRAWING NUMBER	C-1.0
DRAWING TITLE	UTIL
SHEET NUMBER	4 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	DT
DRAWN	TDS
CHECKED	TDS
APPROVED	T. SCHERWITZ
PROJECT	WASHTENAW ARMORY - CONSTRUCTION ADDITION
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR 	
816 E 4th St. 48067 248.542.7866 / www.ghfa.com 	

BENCHMARKS

DATUM: NAVD88

BM A:
TOP ARROW ON HYDRANT, 640± SOUTH OF CENTERLINE S HURON RIVER DRIVE & 92± WEST OF THE WEST BUILDING WALL.
ELEV = 747.32

BM B:
CHISELED "X" IN NORTH FACE CONCRETE LIGHT POLE BASE, 842± SOUTH OF CENTERLINE S HURON RIVER DRIVE & 43± WEST OF THE WEST BUILDING WALL.
ELEV = 746.70

SOILS INFO

SOIL TYPES ARE ACCORDING TO THE USDA SOIL SURVEY WEB SITE (<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>)

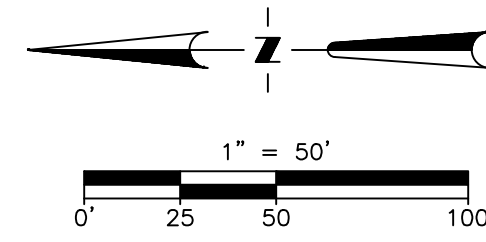
- NaA: NAPPANEE SILTY CLAY LOAM, 0-2% SLOPES
- Pwmaa: PEWAMO CLAY LOAM, DENSE SUBSTANTUM, 0-1% SLOPES
- SfB: SEWARD SANDY LOAM, LOAMY SUBSOIL VARIANT, 2-6% SLOPES
- StB: ST CLAIR CLAY LOAM, 2-6% SLOPES
- YpA: YPSI SANDY LOAM, 0-4% SLOPES

PROPERTY SIZE

PROPERTY AREA IN SF = 881,828.64 SF
PROPERTY AREA IN ACRES = 20.244 ACRES

EXISTING PARKING

- 170 REGULAR SPACES
- 7 BARRIER FREE SPACES
- 177 TOTAL PARKING SPACES



Allan W. Pruss

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th St. #8067
248.642.7866 / www.gpinc.com
FORBES
INCORPORATED

PROJECT
WASHTENAW ARMORY - CONSTRUCTION ADDITION

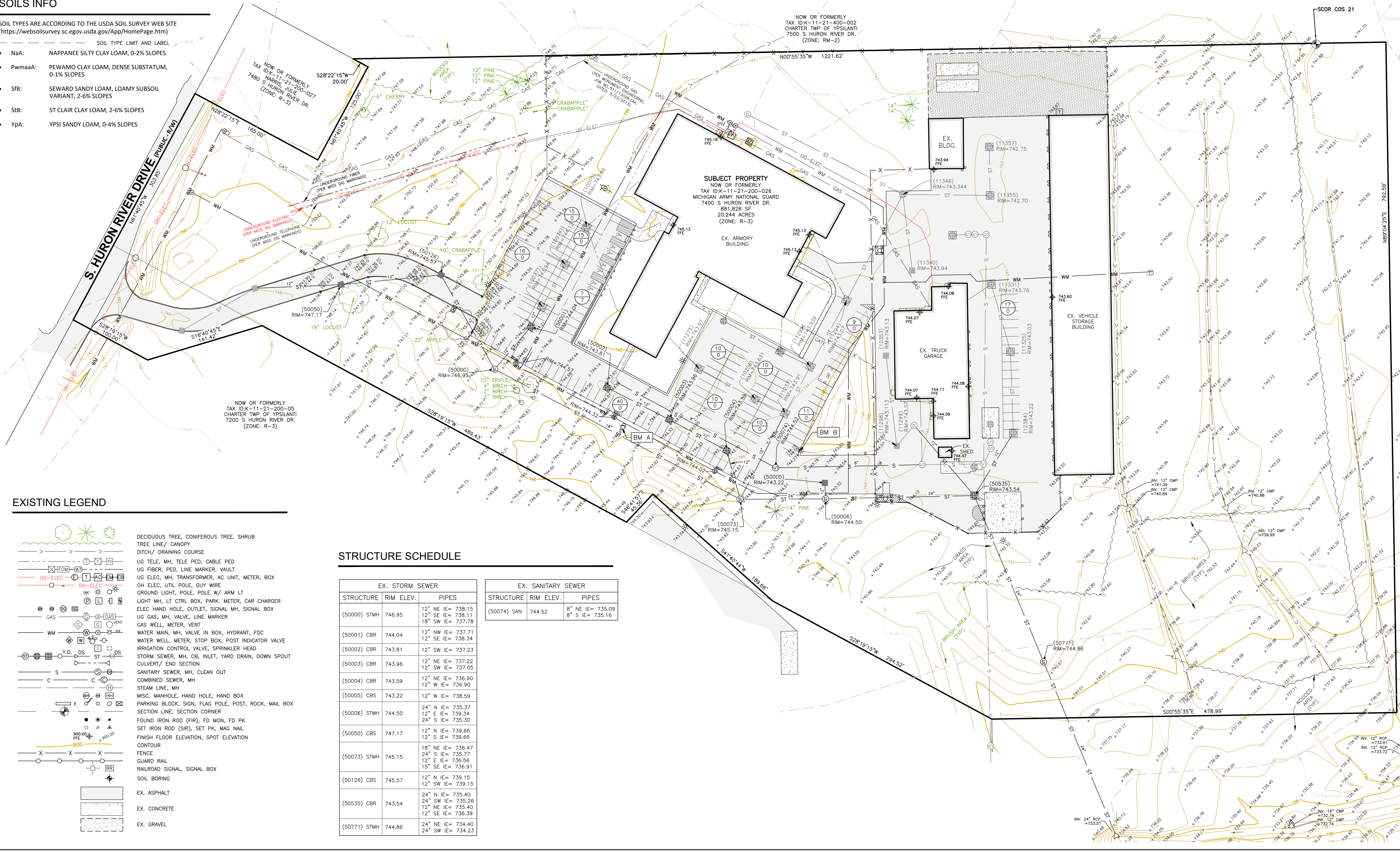
DESIGNED
DT

DATE
04/01/2022

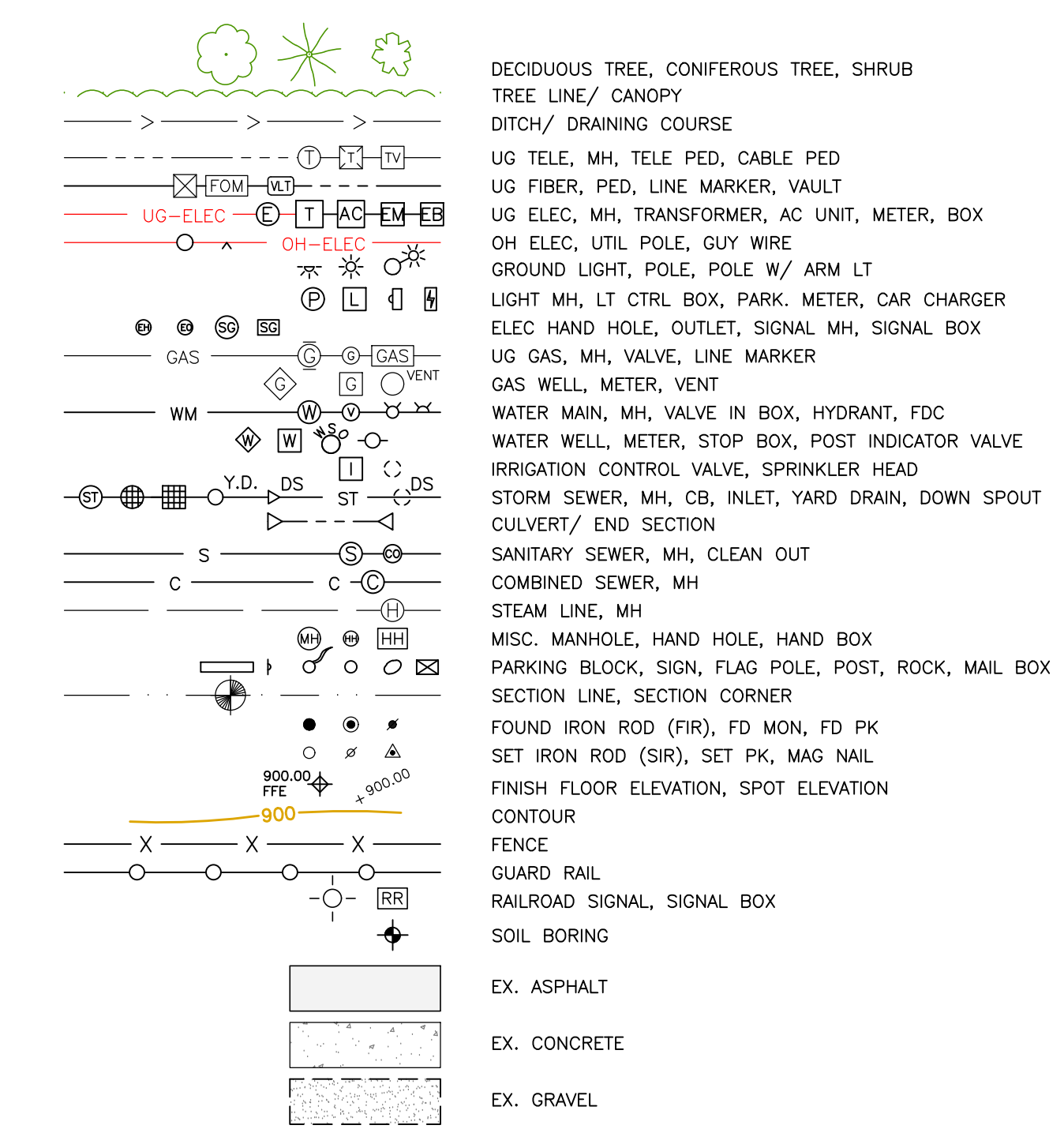
ISSUED FOR
CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTENAW ARMORY
CONTRACT NUMBER: 121456
FILE NO. 511/21326.CAK
DWG PROJECT NO. 2638922016

SHEET NUMBER
5 OF 96
DRAWING TITLE
TOPO
V-1.0

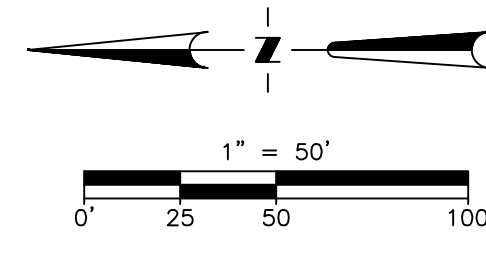


EXISTING LEGEND



STRUCTURE SCHEDULE

EX. STORM SEWER			EX. SANITARY SEWER		
STRUCTURE	RIM ELEV.	PIPES	STRUCTURE	RIM ELEV.	PIPES
(50000) STMH	746.95	12" NE IE = 738.15 12" SE IE = 738.11 18" SW IE = 737.78	(50074) SAN	744.52	8" NE IE = 735.09 8" S IE = 735.16
(50001) CBR	744.04	12" NW IE = 737.71 12" SE IE = 738.34			
(50002) CBR	743.81	12" SW IE = 737.23			
(50003) CBR	743.96	12" NE IE = 737.22 12" SW IE = 737.05			
(50004) CBR	743.59	12" NE IE = 736.90 12" W IE = 736.90			
(50005) CBS	743.22	12" W IE = 738.59			
(50006) STMH	744.50	24" N IE = 735.37 12" E IE = 739.34 24" S IE = 735.30			
(50050) CBS	747.17	12" N IE = 739.66 12" S IE = 739.66			
(50073) STMH	745.15	18" NE IE = 736.47 24" S IE = 735.77 12" E IE = 736.56 15" SE IE = 736.91			
(50126) CBS	745.57	12" N IE = 739.15 12" SW IE = 739.15			
(50535) CBR	743.54	24" N IE = 735.40 24" SW IE = 735.26 12" NE IE = 735.40 12" SE IE = 736.39			
(50771) STMH	744.86	24" NE IE = 734.40 24" SW IE = 734.23			



Allan W. Pruss

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th ST.
248.642.7866 / www.gptco.com
[FORBES]
CONSULTANTS

PROJECT
WASHTENAW ARMYRY
ADDITION

DESIGNED
DT
DRAWN
CHECKED TDS
APPROVED T. SCHERWITZ

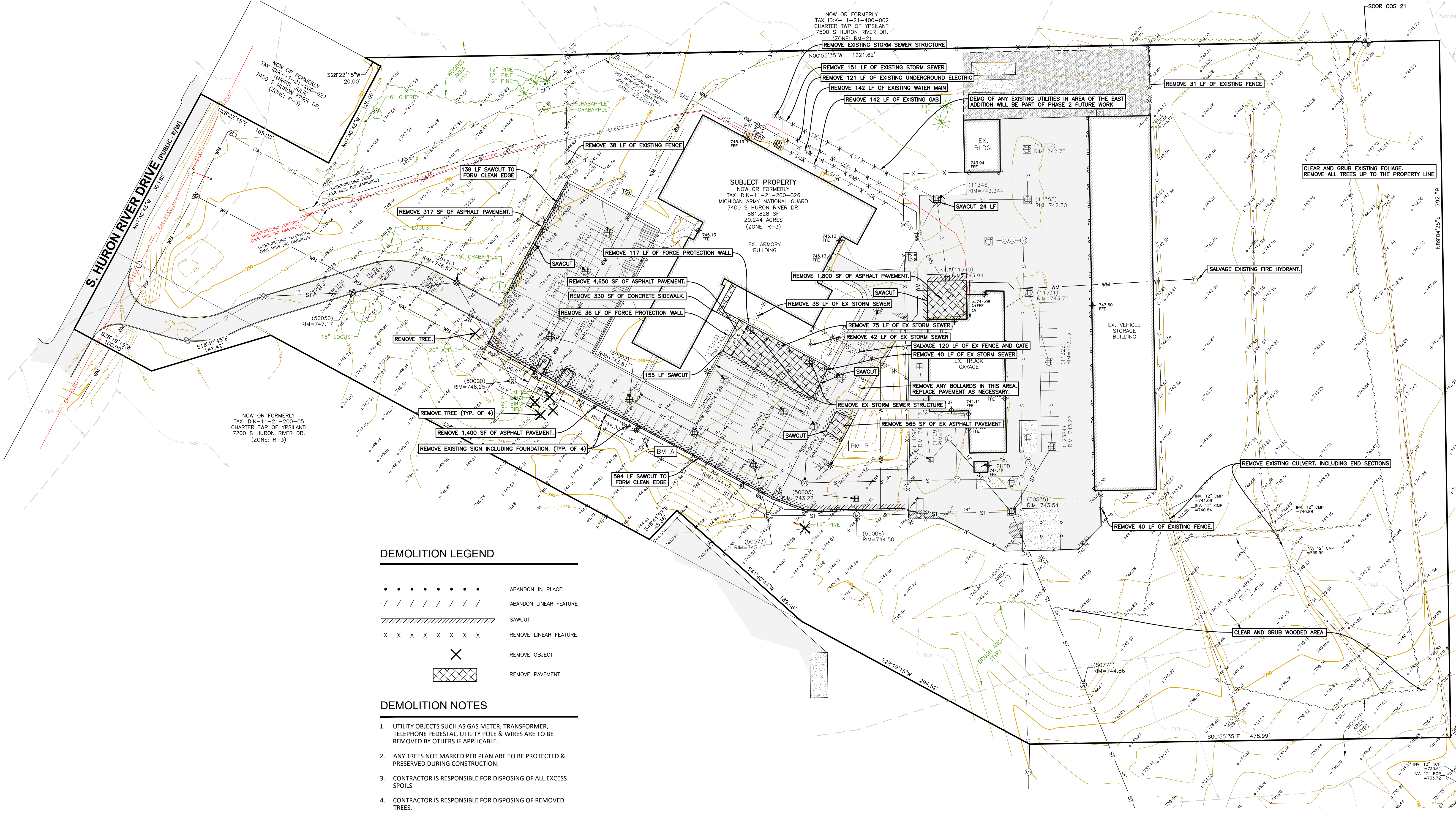
DATE
04/01/2022

ISSUED FOR
CONSTRUCTION
DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTENAW ARMYRY
CONTRACT NUMBER: 121456
FILE NO. 511/21326.0AK
DMA PROJECT NO. 2638922016

SHEET NUMBER
6 OF 96

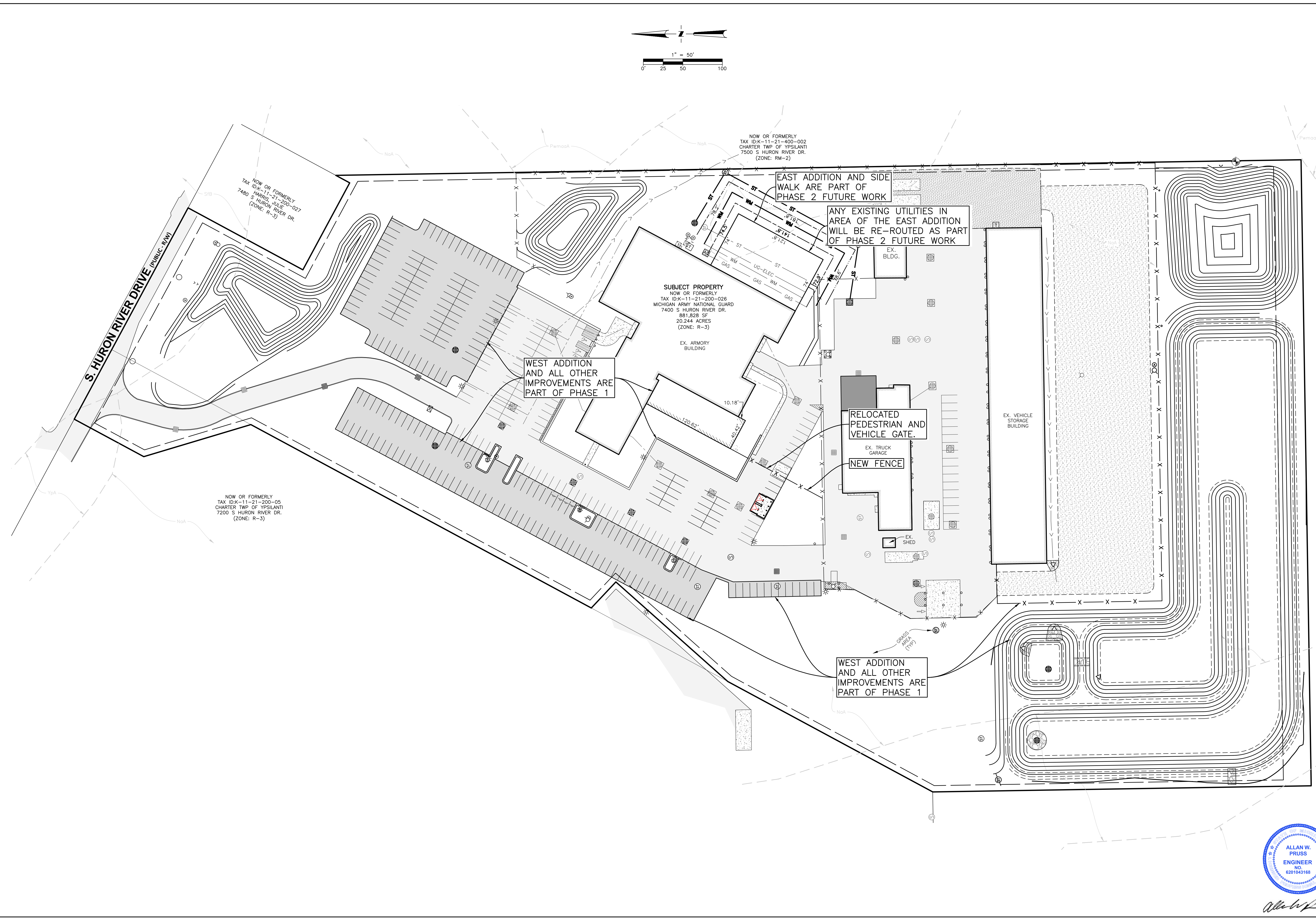
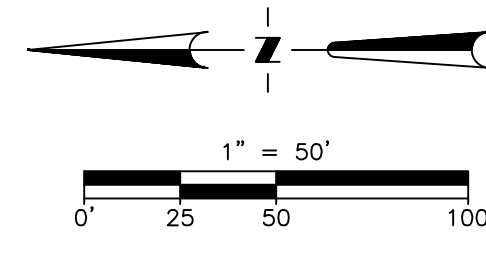
DRAWING TITLE
DEMO
CD-1.0



DEMOLITION LEGEND

.....	ABANDON IN PLACE
////	ABANDON LINEAR FEATURE
////	SAWCUT
-X-X-X-X-X-X-X-	REMOVE LINEAR FEATURE
X	REMOVE OBJECT
XXXX	REMOVE PAVEMENT

- DEMOLITION NOTES**
- UTILITY OBJECTS SUCH AS GAS METER, TRANSFORMER, TELEPHONE PEDESTAL, UTILITY POLE & WIRES ARE TO BE REMOVED BY OTHERS IF APPLICABLE.
 - ANY TREES NOT MARKED PER PLAN ARE TO BE PROTECTED & PRESERVED DURING CONSTRUCTION.
 - CONTRACTOR IS RESPONSIBLE FOR DISPOSING OF ALL EXCESS SPOILS
 - CONTRACTOR IS RESPONSIBLE FOR DISPOSING OF REMOVED TREES.



NOW OR FORMERLY
TAX ID:K-11-21-200-027
7480 S HURON RIVER DR.
(ZONE: R-3)

NOW OR FORMERLY
TAX ID:K-11-21-400-002
CHARTER TWP OF YPSILANTI
7500 S HURON RIVER DR.
(ZONE: RM-2)

SUBJECT PROPERTY
NOW OR FORMERLY
TAX ID:K-11-21-200-026
MICHIGAN ARMY NATIONAL GUARD
7400 S HURON RIVER DR.
881,828 SF
20.244 ACRES
(ZONE: R-3)

NOW OR FORMERLY
TAX ID:K-11-21-200-05
CHARTER TWP OF YPSILANTI
7200 S HURON RIVER DR.
(ZONE: R-3)

EAST ADDITION AND SIDE
WALK ARE PART OF
PHASE 2 FUTURE WORK

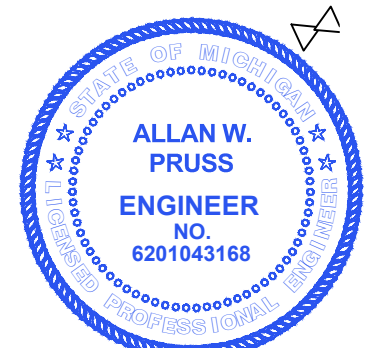
ANY EXISTING UTILITIES IN
AREA OF THE EAST ADDITION
WILL BE RE-ROUTED AS PART
OF PHASE 2 FUTURE WORK

WEST ADDITION
AND ALL OTHER
IMPROVEMENTS ARE
PART OF PHASE 1

RELOCATED
PEDESTRIAN AND
VEHICLE GATE.

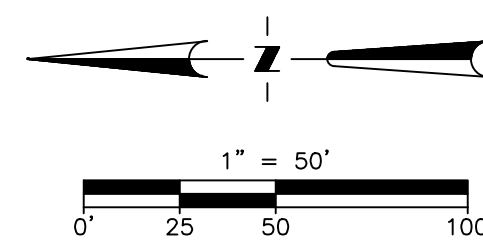
NEW FENCE

WEST ADDITION
AND ALL OTHER
IMPROVEMENTS ARE
PART OF PHASE 1



Allan W. Pruss

DRAWING NUMBER	C-1.0	DRAWING TITLE	PHASE
	7 OF 96		PHASE
SHEET NUMBER	7 OF 96	ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022	DESIGNED	DT
PROJECT	WASHENAW ARMORY - CONSTRUCTION ADDITION	DRAWN	TDS
		CHECKED	TDS
		APPROVED	T. SCHERWITZ
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR			
816 E 4th St. 48967 FORBES 248.942.7866 / www.ghfca.com			



EXISTING PARKING (FROM TOPO)

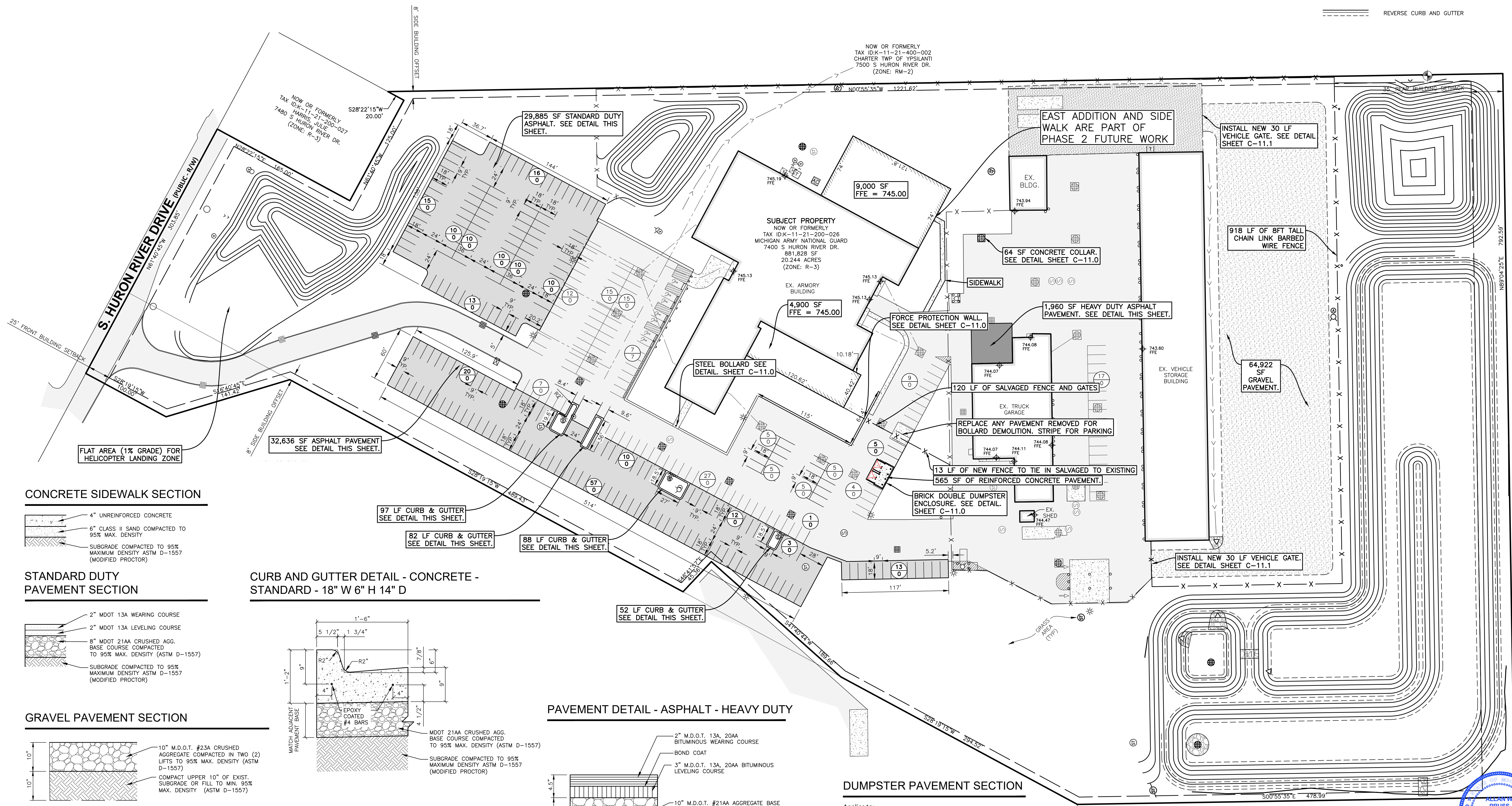
173	REGULAR SPACES	REGULAR SPACES
7	BARRIER FREE SPACES	BARRIER FREE SPACES
180	TOTAL PARKING SPACES	

PROPOSED PARKING

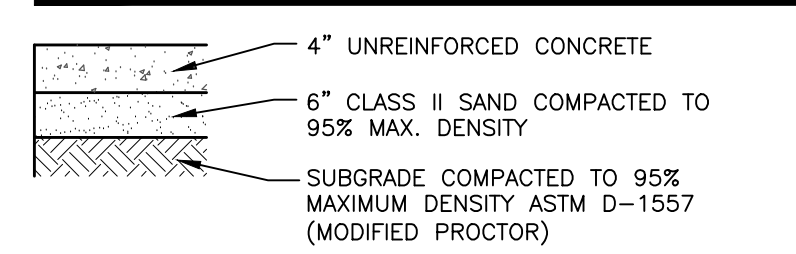
EX. REGULAR SPACES:	133	REGULAR SPACES
EX. BARRIER FREE SPACES:	7	BARRIER FREE SPACES
REGULAR SPACES:	215	
BARRIER FREE SPACES:	0	
TOTAL PARKING PROVIDED:	355	

PAVEMENT LEGEND

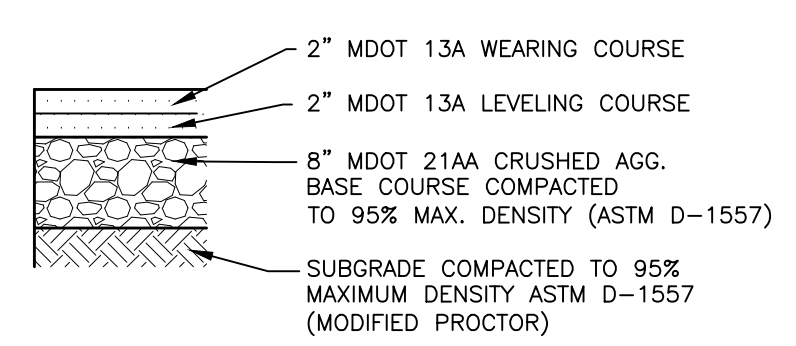
[Symbol]	EX. ASPHALT
[Symbol]	EX. CONCRETE
[Symbol]	EX. GRAVEL
[Symbol]	PR. STANDARD DUTY ASPHALT
[Symbol]	PR. HEAVY DUTY ASPHALT
[Symbol]	PR. CONCRETE
[Symbol]	PR. GRAVEL
[Symbol]	STANDARD CURB AND GUTTER
[Symbol]	REVERSE CURB AND GUTTER



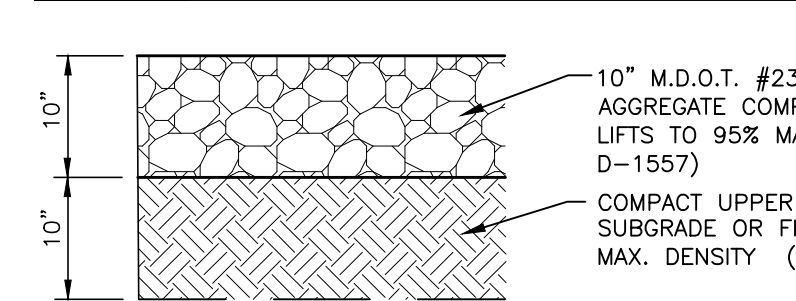
CONCRETE SIDEWALK SECTION



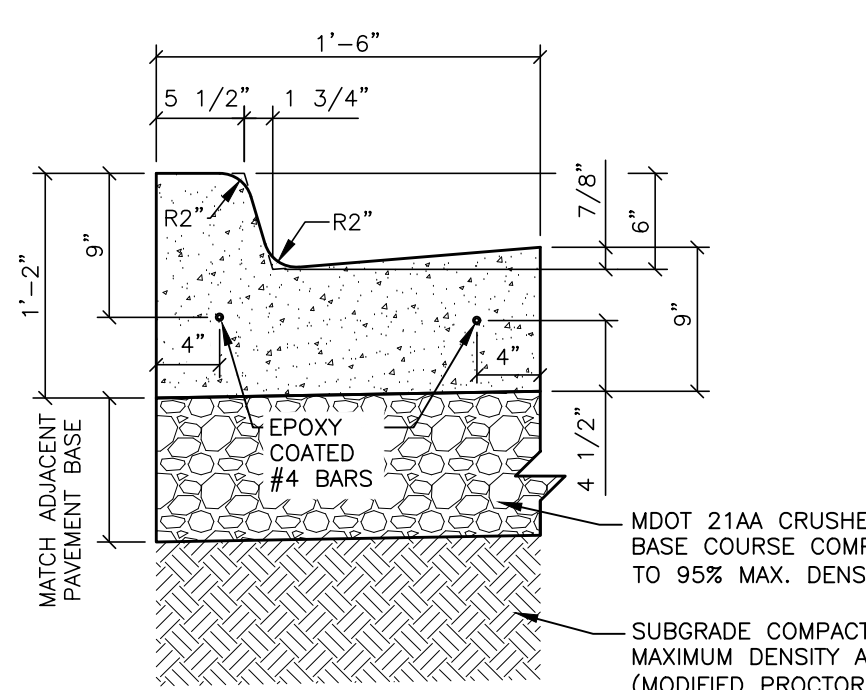
STANDARD DUTY PAVEMENT SECTION



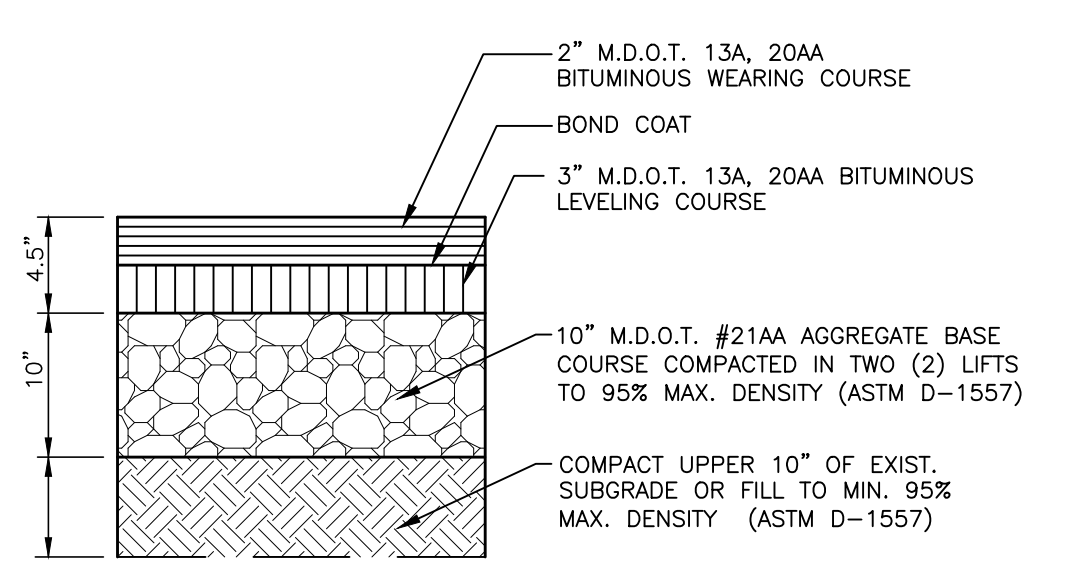
GRAVEL PAVEMENT SECTION



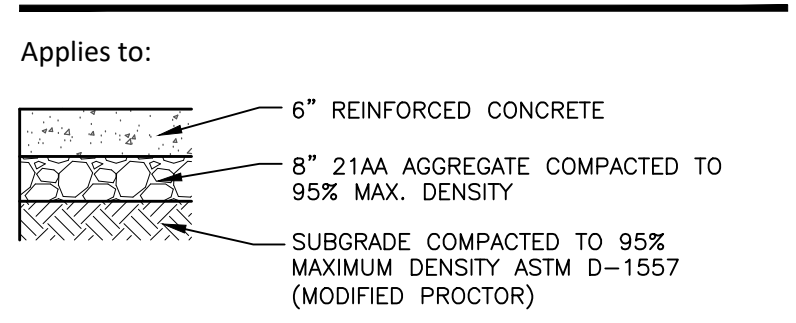
CURB AND GUTTER DETAIL - CONCRETE - STANDARD - 18" W 6" H 14" D



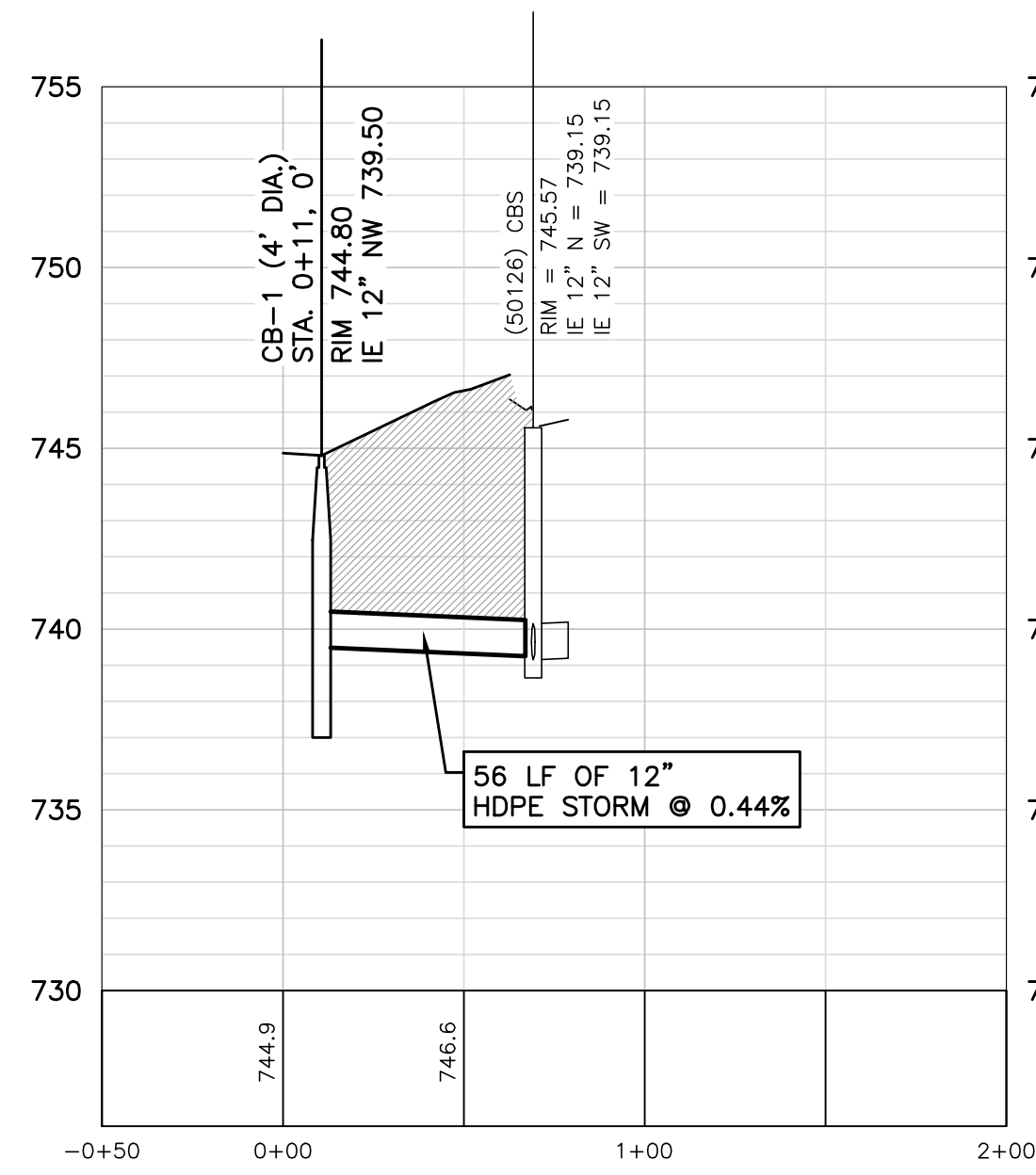
PAVEMENT DETAIL - ASPHALT - HEAVY DUTY



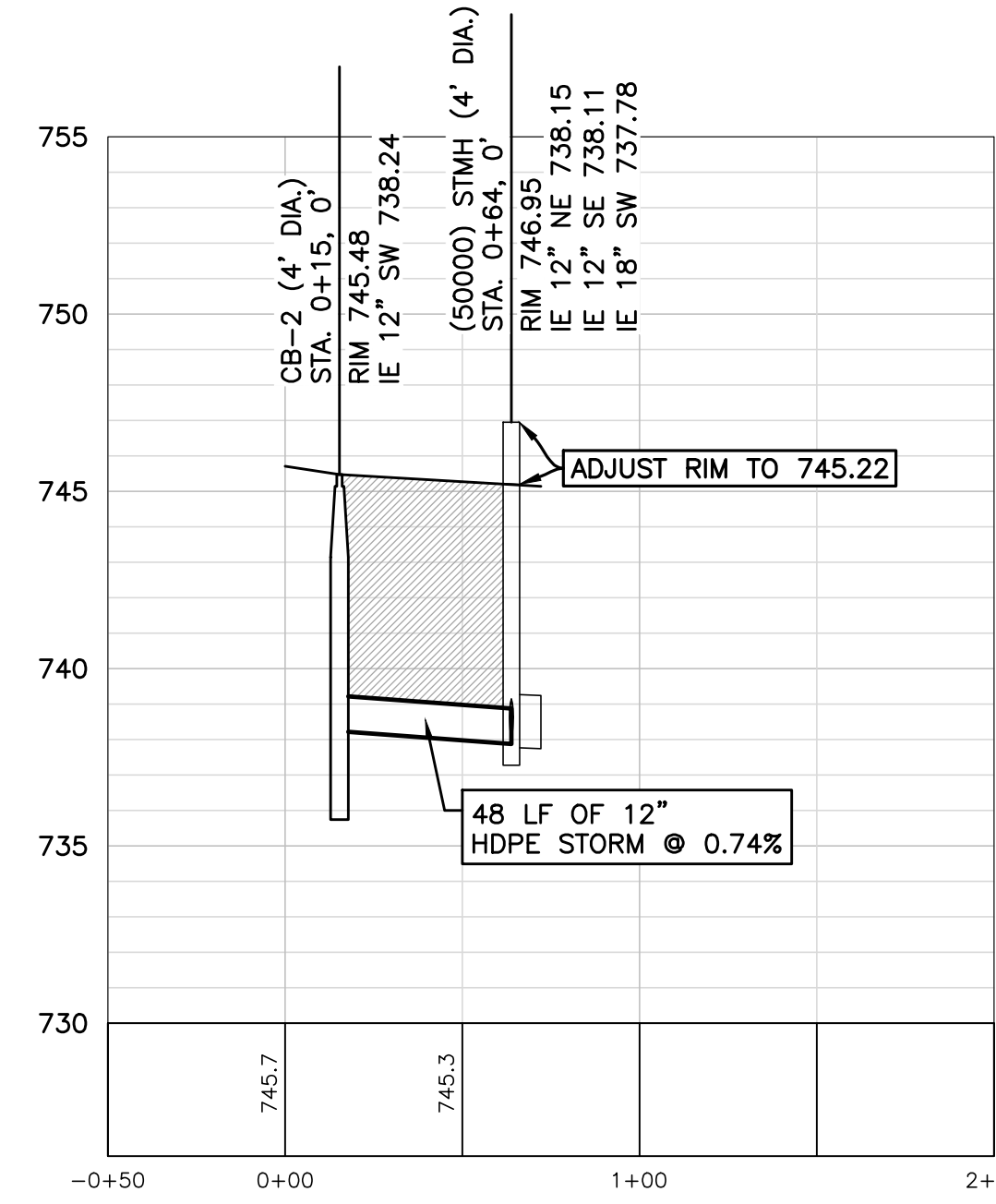
DUMPSTER PAVEMENT SECTION



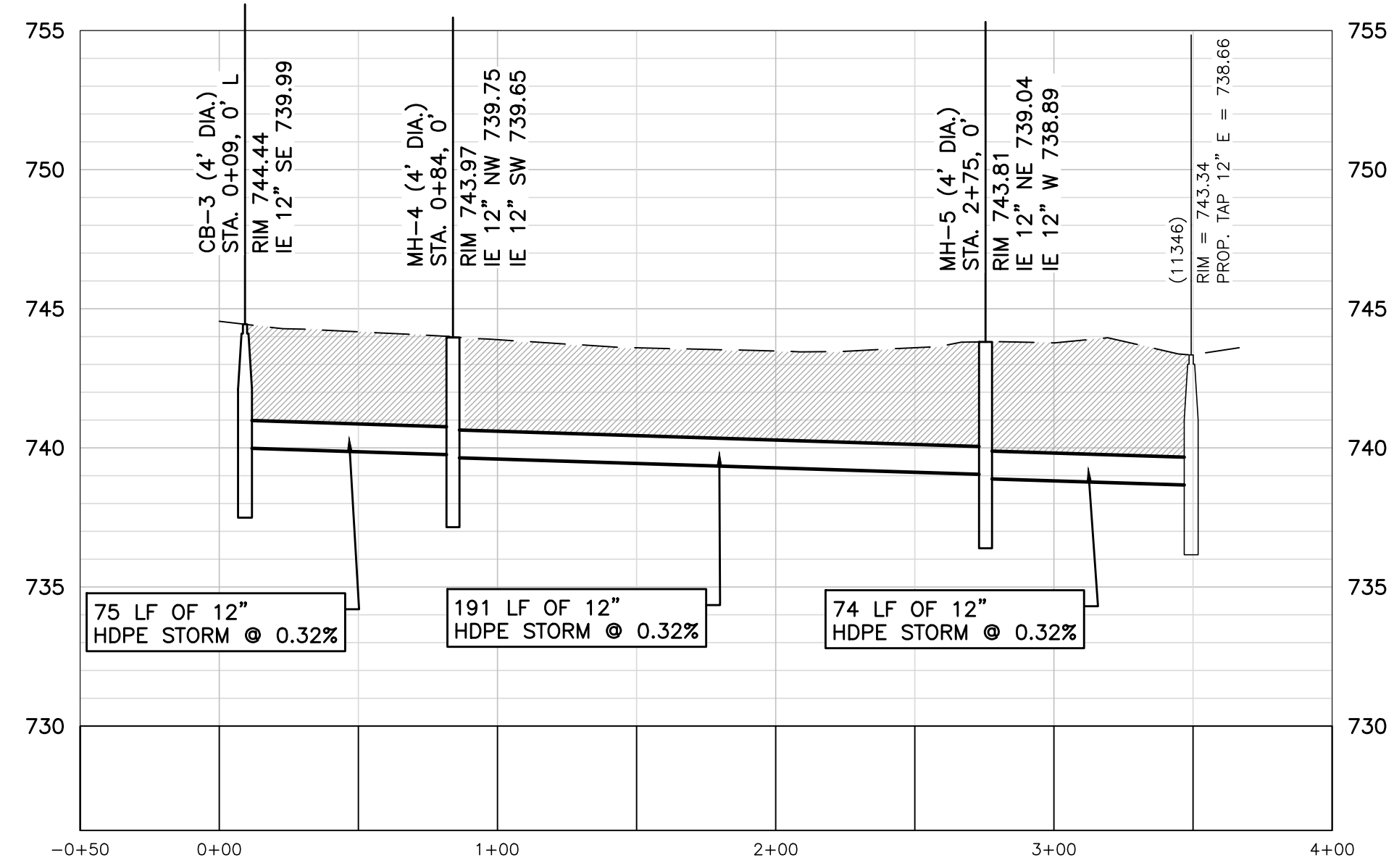
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
 PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
 ADAM P. LACH, RA, DIRECTOR
 PROJECT: WASHTEANAW ARMY - CONSTRUCTION
 WASHTEANAW ARMY ADDITION
 DRAWN BY: I. SCHEWITZ
 CHECKED BY: I. SCHEWITZ
 DATE: 04/01/2022
 ISSUED FOR: CONSTRUCTION DOCUMENTS
 SHEET NUMBER: 8 OF 96
 DIM-PAV
 C-1.1
 IDENTIFICATION NUMBER: PROJECT: WASHTEANAW ARMY
 CONTRACT NUMBER: 121456
 FILE NO. 511/21326.CAK
 DWA PROJECT NO. 2638022016
 816 E 4th ST. 48967
 [FORBES] 248.942.7866/www.phico.com
 ALLAN W. PRUSS ENGINEER NO. 6201043168



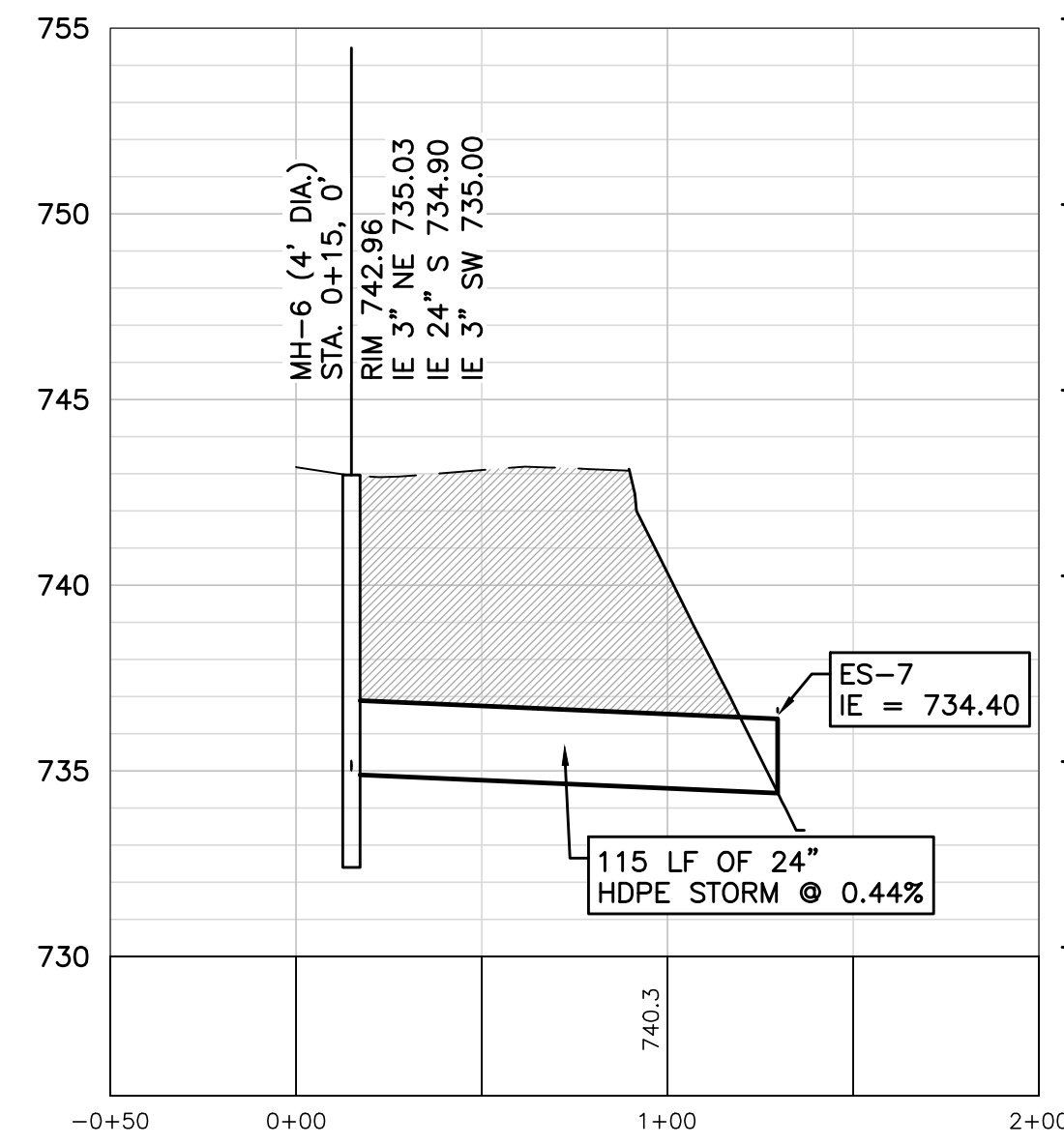
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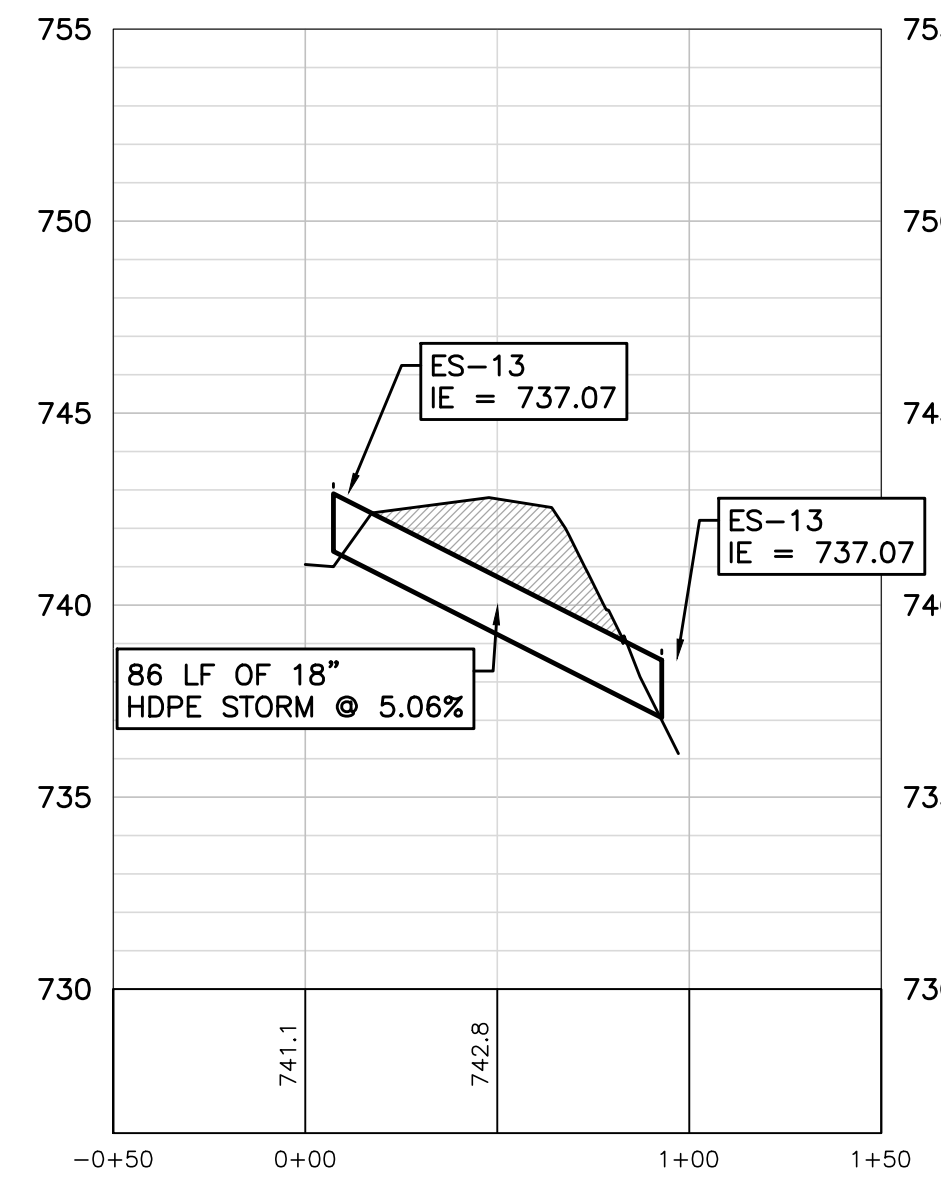
CB-2 - 50000



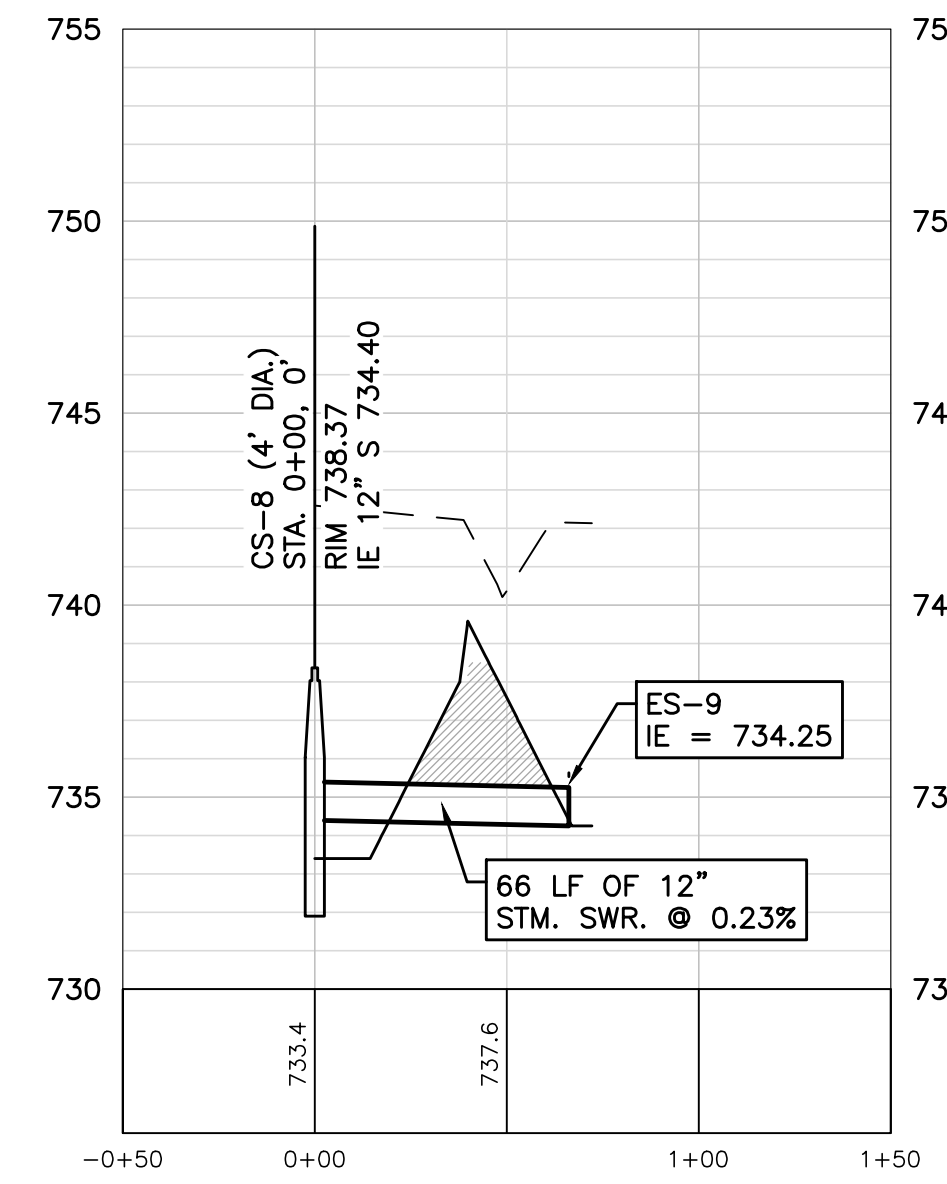
CB-3 - 11346



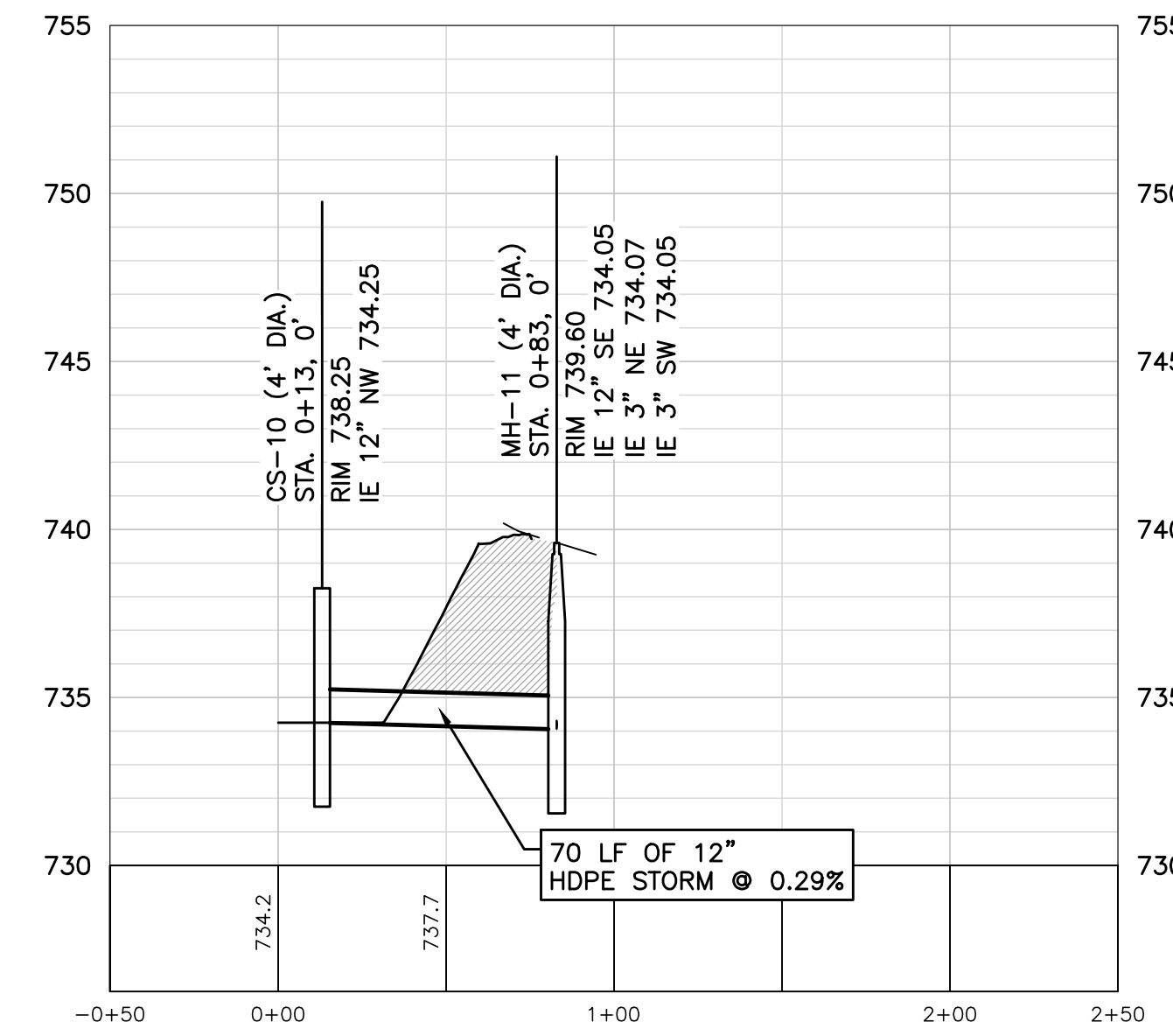
MH6-ES7



ES12-ES13

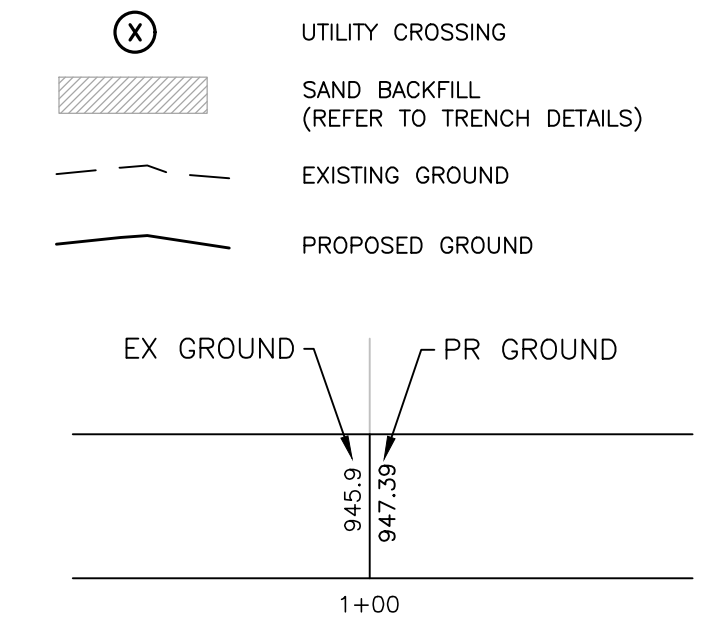


CS8-ES9



CS10-MH11

PROFILE LEGEND



NOTES

- SAND BACKFILL AND BEDDING TO BE MDTOT CL II.
- MAINTAIN MINIMUM 18" VERTICAL CLEARANCE BETWEEN ALL UTILITIES.

PROFILE SCALE
HORIZ: 1"=50'
VERT: 1"=5'



Allan W. Pruss

DRAWING NUMBER	C-3.1	DRAWING TITLE	UTIL	SHEET NUMBER	10 OF 96	IDENTIFICATION NUMBER	PROJECT: WASHTEENAW ARMORY CONTRACT NUMBER: 121456 FILE NO. 511/21326.CAK DMA PROJECT NO. 2658922016	ISSUED FOR	CONSTRUCTION DOCUMENTS	DATE	04/01/2022	DESIGNED	DT	PROJECT	WASHTEENAW ARMORY - CONSTRUCTION ADDITION
												CHECKED	TDS		
												APPROVED	I. SCHERWITZ		

BENCHMARKS

DATUM: NAVD88

BM A:
TOP ARROW ON HYDRANT, 640± SOUTH OF CENTERLINE S HURON RIVER DRIVE & 92± WEST OF THE WEST BUILDING WALL.
ELEV = 747.32

BM B:
CHISELED "X" IN NORTH FACE CONCRETE LIGHT POLE BASE, 842± SOUTH OF CENTERLINE S HURON RIVER DRIVE & 43± WEST OF THE WEST BUILDING WALL.
ELEV = 746.70

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- Pwmaaa: PEWAMO CLAY LOAM, DENSE SUBSTANTUM, 0-1% SLOPES
- Sfb: SEWARD SANDY LOAM, LOAMY SUBSOIL VARIANT, 2-6% SLOPES
- Stb: ST CLAIR CLAY LOAM, 2-6% SLOPES
- Ypa: YPSI SANDY LOAM, 0-4% SLOPES

CONSTRUCTION SEQUENCE	OPERATION TIME SCHEDULE - BEGINNING APRIL 2021						
	APR	MAY	JUN	JUL	AUG	SEP	
1 CONTRACTOR SHALL INSTALL SILT FENCE AS SHOWN ON APPROVED PLANS.							
2 DETENTION BASIN SHALL BE EXCAVATED, TOP SOILED, AND SEEDED IMMEDIATELY AFTER DEMOLITION WORK IS COMPLETED.							
3 REMOVE ALL TOPSOIL AND ORGANIC MATTER. TOPSOIL MAY BE STORED ON SITE IN DESIGNATED AREA TO BE USED FOR FUTURE PLANTING AND FILL AREAS. TRUCK REMAINING TOP SOIL OFFSITE AND PROPERLY DISPOSE.							
4 ROUGH GRADE AND INSTALL NEW UNDERGROUND UTILITIES. PLACE INLET FILTERS AT PROPOSED CATCH BASINS THROUGHOUT SITE.							
5 CONSTRUCT BUILDINGS.							
6 FINISH GRADE AROUND BUILDINGS AND STABILIZE AS SOON AS POSSIBLE. STABILIZE ALL DISTURBED AREAS WITH CLASS A SEED AND MULCH. IN AREAS OF SLOPES OF 1:4 OR STEEPER, CONTRACTOR TO SEED AND INSTALL PEGGED IN PLACE EROSION CONTROL BLANKETS.							
7 REPAIR/CLEAN INLET FILTERS AS REQUIRED.							
8 INSTALL FINAL LANDSCAPING PER SEPARATE LANDSCAPE PLAN.							
9 STONE AROUND OUTLET STANDPIPE STRUCTURE SHALL BE REFRESHED.							
10 REMOVE TEMPORARY SOIL EROSION MEASURES ONCE SEEDED VEGETATION HAS BEEN ESTABLISHED. CLEAN ALL AFFECTED STORM STRUCTURES AS NECESSARY.							

EROSION CONTROL QUANTITIES

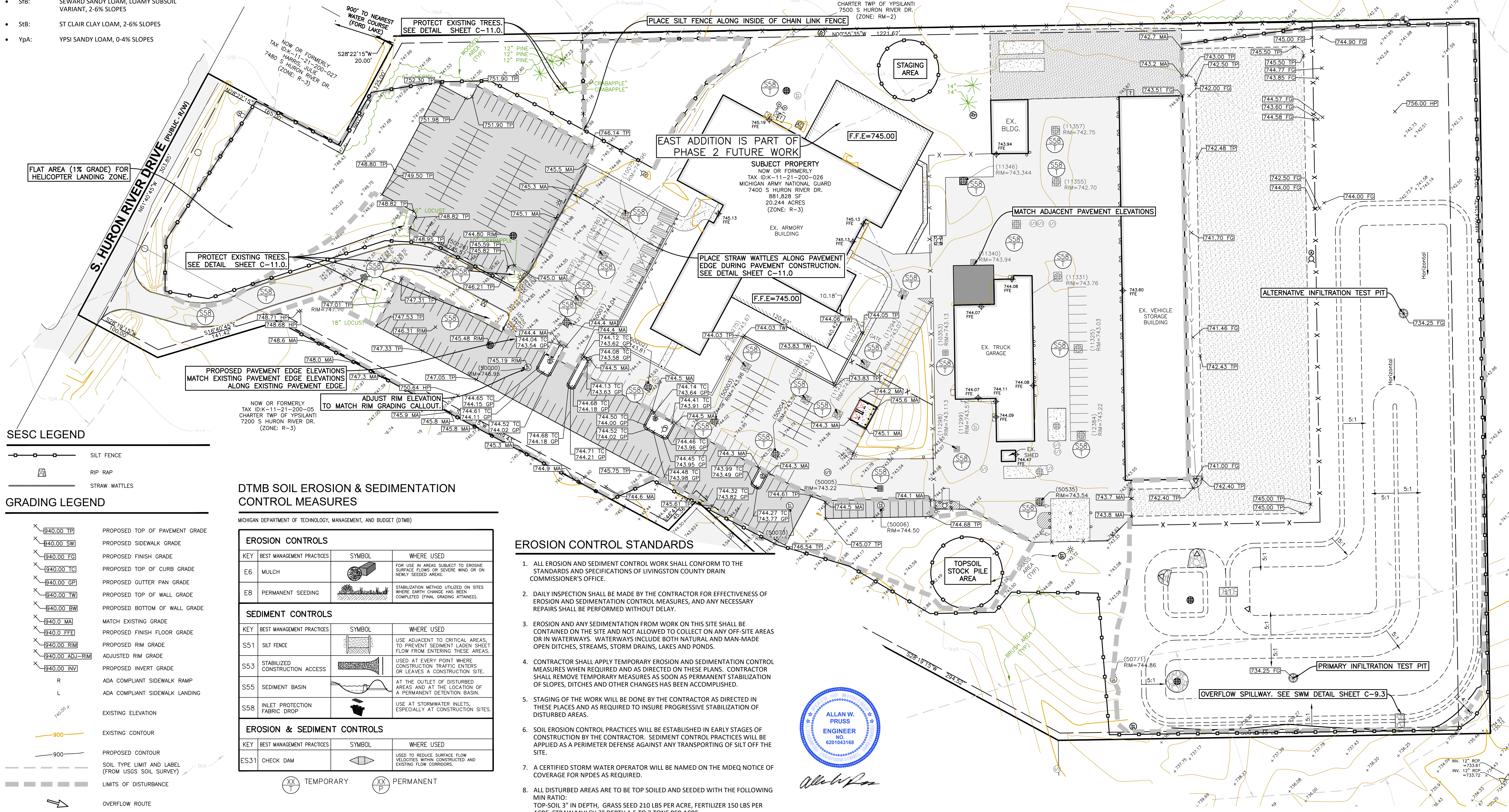
Disturbed Area: 9.88 Acres

QTY	UNIT	ITEM
4387	LF	SILT FENCE
29	EA	INLET FILTER
103	SY	RIP-RAP

NOTE: QUANTITIES ARE FOR ENTIRE SITE

SOIL EROSION CONTROL MAINTENANCE SCHEDULE AND NOTES.

- CONTRACTOR TO PULL, AT NO COST, A SOIL EROSION PERMIT FROM THE DMVA. CONTACT: ROB MACLEOD, ENVIRONMENTAL COMPLIANCE, ENVIRONMENTAL DIVISION, MICHIGAN DEPARTMENT OF MILITARY AND VETERANS AFFAIRS, 3423 N. MARTIN LUTHER KING JR. BLVD., LANSING, MI 48906. EMAIL: ROBERT.K.MACLEOD2.NFG@ARMY.MIL, MOBILE: 517-290-4991.
- EARTHWORK SHALL BE LIMITED TO THE PROPOSED SITE AS SHOWN ON THE PLAN.
- CONTRACTOR SHALL INSPECT THE SOIL EROSION/SEDIMENTATION CONTROL DEVICES ONCE A WEEK AND/OR WITHIN 24 HOURS OF A RAINFALL EVENT WHICH RESULTS IN A STORM WATER DISCHARGE FROM THE SITE. ANY DAMAGE TO EROSION CONTROL MEASURES MUST BE REPAIRED IMMEDIATELY.
- ALL MUD OR DEBRIS TRACKED ONTO EXISTING PUBLIC ROADS FROM THE SITE DUE TO CONSTRUCTION SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
- SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT-UP SEDIMENT WHEN THE SEDIMENT HEIGHT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR RE-BACKFILL THE SILTATION FENCE SHOULD IT FAIL OR BE DAMAGED DURING CONSTRUCTION.
- PERMANENT STABILIZATION MUST BE COMPLETED WITHIN 30 DAYS OF FINAL GRADING.
- ACCESS ROADS MUST BE MAINTAINED AS NECESSARY, TO KEEP THEM EFFECTIVE. NEW LAYERS OF STONE MAY BE ADDED AS OLD LAYERS BECOME COMPACTED. STEPS SHOULD ALSO BE TAKEN TO REPAIR THE ACCESS ROADS IF RUTS OR PONDING WATER APPEARS.
- INLET FILTERS SHOULD BE INSPECTED FOR BUILDUP OF SILT AND OTHER DEBRIS. THIS IS EVIDENT IF GEOTEXTILE/SOD STRUCTURE IS CAUSING FLOODING. MAINTENANCE WOULD CONSIST OF REMOVING OF SEDIMENTS WITH A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. IF INLET FILTER IS BEYOND THIS LEVEL OF REPAIR, IT MAY BE NECESSARY TO REPLACE BOTH THE SOD AND GEOTEXTILE FILTER.
- IF SOIL EROSION/SEDIMENT CONTROL MEASURES ARE INADEQUATE FOR THE SITE, THE PROPER EROSION CONTROL AUTHORITY MUST BE NOTIFIED.



SESC LEGEND

- SILT FENCE
- RIP RAP
- STRAW WATTLES

GRADING LEGEND

- PROPOSED TOP OF PAVEMENT GRADE
- PROPOSED SIDEWALK GRADE
- PROPOSED FINISH GRADE
- PROPOSED TOP OF CURB GRADE
- PROPOSED GUTTER PAN GRADE
- PROPOSED TOP OF WALL GRADE
- PROPOSED BOTTOM OF WALL GRADE
- MATCH EXISTING GRADE
- PROPOSED FINISH FLOOR GRADE
- PROPOSED RIM GRADE
- ADJUSTED RIM GRADE
- PROPOSED INVERT GRADE
- R ADA COMPLIANT SIDEWALK RAMP
- L ADA COMPLIANT SIDEWALK LANDING
- EXISTING ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- SOIL TYPE LIMIT AND LABEL (FROM USGS SOIL SURVEY)
- LIMITS OF DISTURBANCE
- OVERFLOW ROUTE

DTMB SOIL EROSION & SEDIMENTATION CONTROL MEASURES

MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT, AND BUDGET (DTMB)

EROSION CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E6	MULCH		FOR USE IN AREAS SUBJECT TO EROSION SURFACE FLOWS OR SEVERE WIND OR ON NEWLY SEEDED AREAS.
E8	PERMANENT SEEDING		STABILIZATION METHOD UTILIZED ON SITES WHERE EARTH CHANGE HAS BEEN COMPLETED (FINAL GRADING ATTAINED).
SEDIMENT CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
S51	SILT FENCE		USE ADJUNCT TO CRITICAL AREAS, TO PREVENT SEDIMENT LADEN SHEET FLOW FROM ENTERING THESE AREAS.
S53	STABILIZED CONSTRUCTION ACCESS		USED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE.
S55	SEDIMENT BASIN		AT THE OUTLET OF DISTURBED AREAS AND AT THE LOCATION OF A PERMANENT DETENTION BASIN.
S58	INLET PROTECTION FABRIC DROP		USE AT STORMWATER INLETS, ESPECIALLY AT CONSTRUCTION SITES.
EROSION & SEDIMENT CONTROLS			
KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
ES31	CHECK DAM		USED TO REDUCE SURFACE FLOW VELOCITIES WITHIN CONSTRUCTED AND EXISTING FLOW CORRIDORS.

EROSION CONTROL STANDARDS

- ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF LIVINGSTON COUNTY DRAIN COMMISSIONER'S OFFICE.
- DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES, AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
- EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
- CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER CHANGES HAS BEEN ACCOMPLISHED.
- STAGING OF THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLACES AND AS REQUIRED TO INSURE PROGRESSIVE STABILIZATION OF DISTURBED AREAS.
- SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
- A CERTIFIED STORM WATER OPERATOR WILL BE NAMED ON THE MDEQ NOTICE OF COVERAGE FOR NPDES AS REQUIRED.
- ALL DISTURBED AREAS ARE TO BE TOP SOILED AND SEEDED WITH THE FOLLOWING MIN RATIO: TOP-SOIL 3" IN DEPTH, GRASS SEED 210 LBS PER ACRE, FERTILIZER 150 LBS PER ACRE, STRAW MULCH 3" DEPTH 1.5 TO 2 TONS PER ACRE.



STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th St. 48907
248.942.7866 / www.dtmf.com

FORBES
CONSULTANTS

PROJECT: WASHENAW ARMORY - CONSTRUCTION ADDITION

DESIGNED BY: T. SCHEWITZ

DATE: 04/01/2022

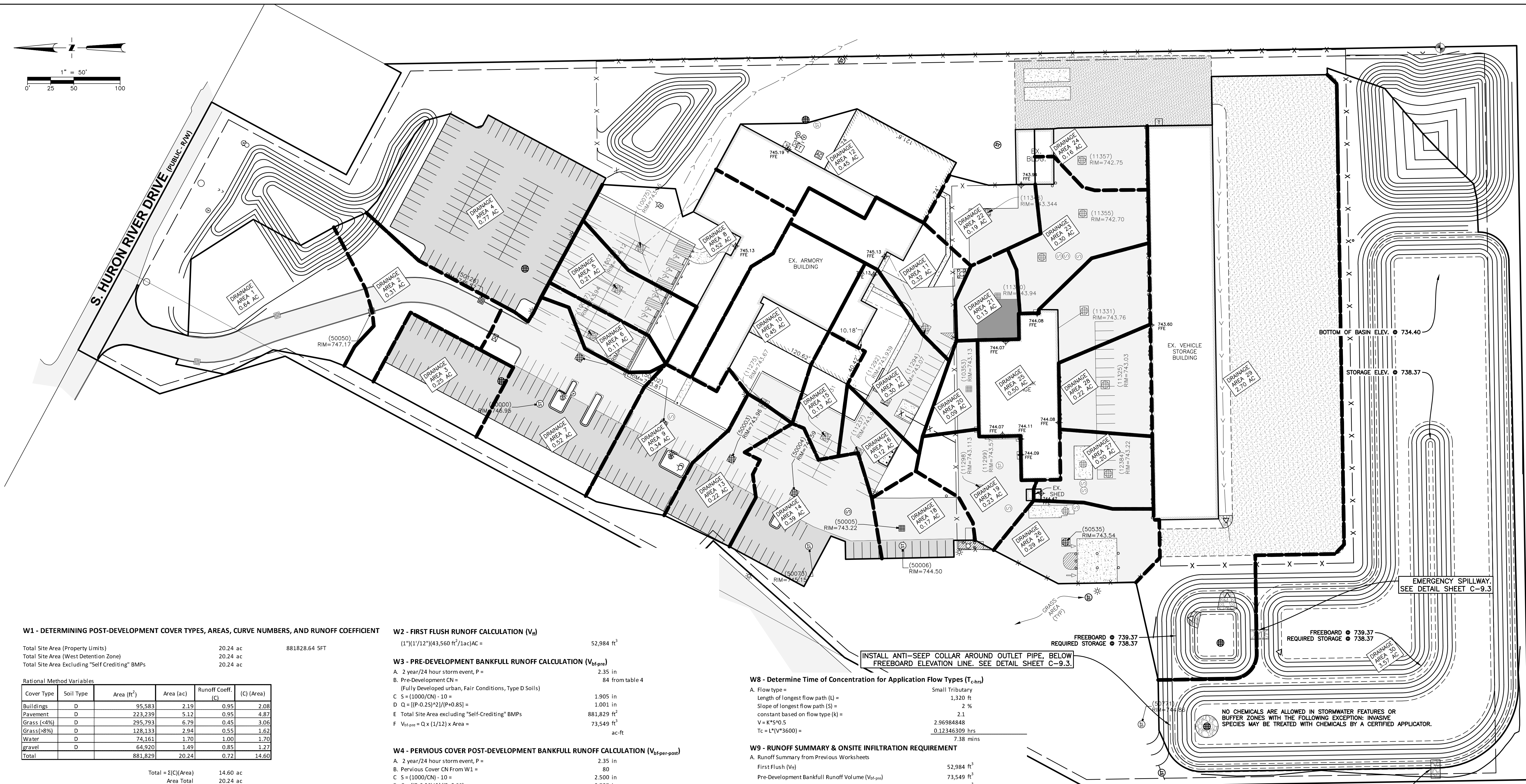
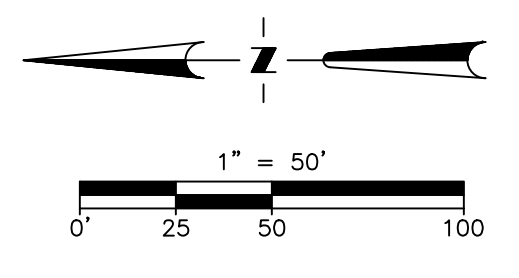
ISSUED FOR: CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER: 121456

SHEET NUMBER: 11 OF 96

DRAWING TITLE: GRAD-SESC

C-7.0



W1 - DETERMINING POST-DEVELOPMENT COVER TYPES, AREAS, CURVE NUMBERS, AND RUNOFF COEFFICIENT

Total Site Area (Property Limits)	20.24 ac	881828.64 SFT
Total Site Area (West Detention Zone)	20.24 ac	
Total Site Area Excluding "Self-Crediting" BMPs	20.24 ac	

Cover Type	Soil Type	Area (ft ²)	Area (ac)	Runoff Coeff. (C)	(C)(Area)
Buildings	D	95,583	2.19	0.95	2.08
Pavement	D	223,239	5.12	0.95	4.87
Grass (<4%)	D	295,793	6.79	0.45	3.06
Grass (>8%)	D	128,133	2.94	0.55	1.62
Water	D	74,161	1.70	1.00	1.70
Gravel	D	64,920	1.49	0.85	1.27
Total		881,829	20.24	0.72	14.60

Total = Σ(C)(Area) = 14.60 ac
 Area Total = 20.24 ac
 Weighted C = Σ(C)(Area)/(Area Total) = 0.72

Cover Type	Soil Type	Area (ft ²)	Area (ac)	Curve Number (CN)	(CN)(Area)
Grass (>8%)	D	128,133	2.94	80	235
Grass (<4%)	D	295,793	6.79	80	543
Total		423,926	9.73	80	779

Total = Σ(CN)(Area) = 779 ac
 Area Total = 9.73 ac
 Weighted CN = Σ(CN)(Area)/(Area Total) = 80

Cover Type	Soil Type	Area (ft ²)	Area (ac)	Curve Number (CN)	(CN)(Area)
Buildings	D	95,583	2.19	98	215
Pavement	D	223,239	5.12	98	502
Water	D	74,161	1.70	98	167
Gravel	D	64,920	1.49	98	146
Total		457,903	10.51	98	1,030

Total = Σ(CN)(Area) = 1,030
 Area Total = 10.51 ac

W2 - FIRST FLUSH RUNOFF CALCULATION (V_{ff})

$(1") \times (1/12") \times (43,560 \text{ ft}^2/1 \text{ ac}) \times \text{AC} = 52,984 \text{ ft}^3$

W3 - PRE-DEVELOPMENT BANKFULL RUNOFF CALCULATION (V_{bf-pre})

- A. 2 year/24 hour storm event, P = 2.35 in
- B. Pre-Development CN = 84 from table 4
- C. S = (1000/CN) - 10 = 1,905 in
- D. Q = [(P-0.25)*2]/(P+0.85) = 1,001 in
- E. Total Site Area excluding "Self-Crediting" BMPs = 881,829 ft²
- F. V_{bf-pre} = Q x (1/12) x Area = 73,549 ft³

W4 - PVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATION (V_{bf-per-post})

- A. 2 year/24 hour storm event, P = 2.35 in
- B. Pervious Cover CN From W1 = 80
- C. S = (1000/CN) - 10 = 2,500 in
- D. Q = [(P-0.25)*2]/(P+0.85) = 0.787 in
- E. Pervious Cover Area from W1 = 423,926 ft²
- F. V_{bf-per-post} = Q x (1/12) x Area = 27,795 ft³

W5 - IMPERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATION (V_{bf-imp-post})

- A. 2 year/24 hour storm event, P = 2.35 in
- B. Impervious Cover CN From W1 = 98
- C. S = (1000/CN) - 10 = 0.204 in
- D. Q = [(P-0.25)*2]/(P+0.85) = 2.122 in
- E. Impervious Cover Area from W1 = 457,903 ft²
- F. V_{bf-imp-post} = Q x (1/12) x Area = 80,960 ft³

W6 - PVIOUS COVER POST-DEVELOPMENT 100-YEAR RUNOFF CALCULATION (V_{100-per-post})

- A. 2 year/24 hour storm event, P = 5.11 in
- B. Pervious Cover CN From W1 = 80
- C. S = (1000/CN) - 10 = 2,500 in
- D. Q = [(P-0.25)*2]/(P+0.85) = 2.989 in
- E. Pervious Cover Area from W1 = 423,926 ft²
- F. V_{100-per-post} = Q x (1/12) x Area = 105,594 ft³

W7 - IMPERVIOUS COVER POST-DEVELOPMENT 100-YEAR STORM RUNOFF CALCULATION (V_{100-imp-post})

- A. 2 year/24 hour storm event, P = 5.11 in
- B. Impervious Cover CN From W1 = 98
- C. S = (1000/CN) - 10 = 0.204 in
- D. Q = [(P-0.25)*2]/(P+0.85) = 4.873 in
- E. Impervious Cover Area from W1 = 457,903 ft²
- F. V_{100-imp-post} = Q x (1/12) x Area = 185,947 ft³

W8 - Determine Time of Concentration for Application Flow Types (T_{ch})

- A. Flow type = Small Tributary
- Length of longest flow path (L) = 1,320 ft
- Slope of longest flow path (S) = 2%
- constant based on flow type (K) = 2.1
- V = K*S*0.5 = 2.96984848
- T_c = L*(V*3600) = 0.123463600 hrs = 7.38 mins

W9 - RUNOFF SUMMARY & ONSITE INFILTRATION REQUIREMENT

First Flush (V _{ff})	52,984 ft ³
Pre-Development Bankfull Runoff Volume (V _{bf-pre})	73,549 ft ³
Pervious Cover Post-Development Bankfull Volume (V _{bf-per-post})	27,795 ft ³
Impervious Cover Post-Development Bankfull Volume (V _{bf-imp-post})	80,960 ft ³
Total Bankfull Volume (V_{bf-post})	108,755 ft³
Pervious Cover Post-Development 100-year Volume (V _{100-per-post})	105,594 ft ³
Impervious Cover Post-Development 100-year Volume (V _{100-imp-post})	185,947 ft ³
Total 100-year Volume (V₁₀₀)	291,541 ft³

B. Subtract the Pre-Development Bankfull from the Post-Development Bankfull volume
 Total Post-Development Bankfull Volume (V_{bf-post}) = 108,755 ft³
 Pre-Development Bankfull Runoff Volume (V_{bf-pre}) = 73,549 ft³
 Bankfull Volume Difference = 35,206 ft³

Compare to First Flush Volume (V_{ff}) = 52,984 ft³
Greater of Bankfull Volume or First Flush Volume = 52,984 ft³
 All soils are class D, infiltration is prohibited

W10 - DETENTION/RETENTION REQUIREMENT

- A. Q_p = 238.6T_c^{-0.82} = 1326.20 cfs/(in x m²)
- B. Total Site Area excluding "Self-Crediting" BMPs = 20.24 ac
- C. Q₁₀₀ = Q_{100-per} + Q_{100-imp} = 7.862 in
- D. Peak Flow (PF) = Q_p x Q₁₀₀ x Area/640 = 329.81 ft³
- E. Δ = PF - 0.15 x Area (ac) = 326.77 ft³
- F. V_{det} = Δ/PF x V₁₀₀ = 288,857 ft³

Required Detention not including infiltration credit = 14,577 ft³
 Sediment Forebay Volume Required (5% of V₁₀₀) = 14,577 ft³

W13 - SUMMARY

Site Summary of Infiltration & Detention	
A. Stormwater Management Summary	
Minimum Onsite Infiltration Requirement, V _{inf}	52,984 ft ³
Designed/Provided Infiltration Volume	0 ft ³
% Minimum Required Infiltration Provided	0%
Total Calculated Detention, V _{det}	288,857 ft ³
Net Required Detention Volume (V _{det} - Designed/Provided Infiltration Volume)	288,857 ft ³
B. Detention Volume Increase for sites where the required infiltration volume cannot be achieved	
% Required Infiltration NOT Provided	100%
(100% - %Minimum Required Infiltration Provided)	100%
Net % Penalty	20%
(20% x % Required Infiltration NOT Provided)	
Total Required Detention Volume, including penalty	346,628 ft³
[(100% + Net % Penalty) x Net Required Detention Volume]	

INSTALL ANTI-SEEP COLLAR AROUND OUTLET PIPE, BELOW FREEBOARD ELEVATION LINE. SEE DETAIL SHEET C-9.3.

FREEBOARD • 739.37
 REQUIRED STORAGE • 738.37

NO CHEMICALS ARE ALLOWED IN STORMWATER FEATURES OR BUFFER ZONES WITH THE FOLLOWING EXCEPTION: INVASIVE SPECIES MAY BE TREATED WITH CHEMICALS BY A CERTIFIED APPLICATOR.

EMERGENCY SPILLWAY. SEE SWM DETAIL SHEET C-9.3

INV. 12" RCP = 733.61
 INV. 12" RCP = 733.72



346,628 ft³

DRAINAGE AREA C-VALUES

COMPOUND RUNOFF COEFFICIENT FOR AREA 1				50050-50126			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	27680	0.64					
CONTRIBUTING	27680	0.64					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	8283	0.95	7869				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
GRAVEL	0	0.85	0				
(>8%) GRASS	5552	0.55	3054				
NATURAL AREAS	13845	0.45	6230				
TOTALS	27680		17153				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.62				

COMPOUND RUNOFF COEFFICIENT FOR AREA 6				10077-50001			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	4788	0.11					
CONTRIBUTING	4788	0.11					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	4001	0.95	3801				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
GRAVEL	0	0.85	0				
(>8%) GRASS	0	0.55	0				
NATURAL AREAS	787	0.45	354				
TOTALS	4788		4155				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.87				

COMPOUND RUNOFF COEFFICIENT FOR AREA 11				11294-11292			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	13852	0.32					
CONTRIBUTING	13852	0.32					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	6475	0.95	6151				
EX PAVEMENT	4142	0.95	3935				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
GRAVEL PAVEMENT	0	0.85	0				
(>8%) GRASS	0	0.55	0				
NATURAL AREAS	3235	0.45	1456				
TOTALS	13852		11542				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.83				

COMPOUND RUNOFF COEFFICIENT FOR AREA 16				11237-50073			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	5239	0.12					
CONTRIBUTING	5239	0.12					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	3454	0.90	3109				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
PR GRAVEL	0	0.85	0				
(>8%) GRASS	1278	0.55	703				
NATURAL AREAS	507	0.45	228				
TOTALS	5239		4040				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.77				

COMPOUND RUNOFF COEFFICIENT FOR AREA 21				11340-11346			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	5525	0.13					
CONTRIBUTING	5525	0.13					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	3566	0.90	3209				
PR BUILDING	0	0.95	0				
PR PAVEMENT	1959	0.95	1861				
GRAVEL	0	0.85	0				
(>8%) GRASS	0	0.55	0				
NATURAL AREAS	0	0.45	0				
TOTALS	5525		5070				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.92				

COMPOUND RUNOFF COEFFICIENT FOR AREA 26				50535-MH6			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	12463	0.29					
CONTRIBUTING	12463	0.29					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	12463	0.90	11217				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
PR GRAVEL	0	0.85	0				
(>8%) GRASS	0	0.55	0				
NATURAL AREAS	0	0.45	0				
TOTALS	12463		11217				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.90				

COMPOUND RUNOFF COEFFICIENT FOR AREA 2				50126-50000			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	13375	0.31					
CONTRIBUTING	13375	0.31					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	3960	0.95	3762				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
GRAVEL	0	0.85	0				
(>8%) GRASS	2153	0.55	1184				
NATURAL AREAS	7262	0.45	3268				
TOTALS	13375		8214				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.61				

COMPOUND RUNOFF COEFFICIENT FOR AREA 7				500001-50000			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	22603	0.52					
CONTRIBUTING	22603	0.52					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	9211	0.95	8750				
PR BUILDING	0	0.95	0				
PR PAVEMENT	8720	0.95	8284				
GRAVEL	0	0.85	0				
(>8%) GRASS	3372	0.55	1855				
NATURAL AREAS	1300	0.45	585				
TOTALS	22603		19474				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.86				

COMPOUND RUNOFF COEFFICIENT FOR AREA 12				CB3-11346			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	19547	0.45					
CONTRIBUTING	19547	0.45					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	7242	0.95	6880				
EX PAVEMENT	0	0.90	0				
PR BUILDING	9018	0.95	8567				
PR PAVEMENT	0	0.95	0				
PR GRAVEL	0	0.85	0				
(>8%) GRASS	0	0.55	0				
NATURAL AREAS	3287	0.45	1479				
TOTALS	19547		16926				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.87				

COMPOUND RUNOFF COEFFICIENT FOR AREA 17				11292-11237			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	12971	0.30					
CONTRIBUTING	12971	0.30					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	2754	0.95	2616				
EX PAVEMENT	5171	0.90	4654				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
PR GRAVEL	0	0.85	0				
(>8%) GRASS	1264	0.55	695				
NATURAL AREAS	5046	0.45	2271				
TOTALS	14235		10236				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.79				

COMPOUND RUNOFF COEFFICIENT FOR AREA 22				11346-11294			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	8201	0.19					
CONTRIBUTING	8201	0.19					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	4250	0.90	3825				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
PR GRAVEL	0	0.85	0				
(>8%) GRASS	0	0.55	0				
NATURAL AREAS	3951	0.45	1778				
TOTALS	8201		5603				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.68				

COMPOUND RUNOFF COEFFICIENT FOR AREA 27				12384-50535			
	AREA (SF)	AREA (AC)	C		AREA (SF)	AREA (AC)	C
OVERALL	8555	0.20					
CONTRIBUTING	8555	0.20					
FLOWING OFF	0	0.00					
$A \times C$							
EX BUILDING	0	0.95	0				
EX PAVEMENT	8555	0.90	7700				
PR BUILDING	0	0.95	0				
PR PAVEMENT	0	0.95	0				
PR GRAVEL	0	0.85	0				
(>8%) GRASS	0	0.55	0				
NATURAL AREAS	0	0.45	0				
TOTALS	8555		7700				
$COMPOUND C = \frac{TOTAL A \times C}{CONTRIBUTING AREA}$							
			0.90				

COMPOUND RUNOFF COEFFICIENT FOR AREA 3				CB2-50000			
	AREA (SF)	AREA (AC)	C				

STORAGE ELEVATIONS

STORAGE ELEVATIONS

FIRST FLUSH			
ELEVATION 1 =	734.25	VOLUME 1	0
ELEVATION 2 =	736.00	VOLUME 2	111,854
		Vff	52,984
FF ELEVATION (Zff) =	735.08		
BANKFULL			
ELEVATION 1 =	735.00	VOLUME 1	43,291
ELEVATION 2 =	736.00	VOLUME 2	111,854
		Vbf	108,755
BF ELEVATION (Zbf) =	735.95		
100-YEAR			
ELEVATION 1 =	738.00	VOLUME 1	286,752
ELEVATION 2 =	738.60	VOLUME 2	348,218
		V100	346,628
100 ELEVATION (Z100) =	738.58		

DETENTION BASIN CALCULATIONS

PROPOSED DETENTION BASIN VOLUME

ELEVATION	AREA (FT)	AVG AREA (FT)	INC VOLUME (CF)	VOLUME (CF)
734.25	53104			
735.00	62338	57,721	43,291	43,291
736.00	74788	68,563	68,563	111,854
737.00	87413	81,101	81,101	192,954
738.00	100,183	93,798	93,798	286,752
738.56	119,339	109,761	61,466	348,218

SPILLWAY CALCULATIONS

FOREBAY SPILLWAY

Weir Coefficient (C) = 3.4

$Z_{bank} = 739.58$

$Z_{weir} = 739.08$

$H = Z_{bank} - Z_{weir} = 0.5 \text{ FT}$

Q (from 10 - Year table) = 25.18 CFS

$B = \frac{Q}{C \times H^{3/2}} = 21 \text{ FT}$

BASIN SPILLWAY

Weir Coefficient (C) = 3.4

$Z_{bank} = 739.58$

$Z_{weir} = 739.08$

$H = Z_{bank} - Z_{weir} = 0.5 \text{ FT}$

Q (from 10 - Year table) = 25.18 CFS

$B = \frac{Q}{C \times H^{3/2}} = 21 \text{ FT}$

OUTLET CONTROL STRUCTURE ORIFICE CALCULATIONS

BASIN OUTLET CONTROL STRUCTURE ORIFICE CALCULATIONS

$Q_a = 0.15 \times \text{total acreage} = 3.036 \text{ cfs}$

FIRST FLUSH CONTROL CALCULATIONS

MINIMUM DETENTION TIME OF 24 HOURS

$Q_{ff} = \frac{V_{ff}}{T_{24}} = \frac{V_{ff}}{24 \times 3600} = 0.613 \text{ CFS}$

OPENINGS IN BOTTOM OF BASIN

$Z_{bottom} = 734.25$

$H_{avg} = \frac{2}{3} \times (Z_{ff} - Z_{bottom}) = 0.553 \text{ FT}$

$A_{ff} = \frac{Q_{ff}}{0.62 \sqrt{2 \times g \times H_{avg}}} = 0.166 \text{ SF}$

2" DIA HOLE HAS AN AREA OF

$A_{1"} = 0.167 = 0.0218 \text{ SF} = \text{NOMINAL HOLE AREA}$

NUMBER OF HOLES = $\frac{A_{ff}}{\text{NOMINAL HOLE AREA}} = 7.5995$

ROUNDED TO: 7 - 2" DIA. HOLES

DETENTION TIME FOR SEVEN (7) 2" DIA HOLES

$Q_{ff} = \text{No. of Holes} \times A_{1"} \times 0.62 \sqrt{2 \times g \times h} = 0.5649 \text{ CFS}$

$T_{ff} = \frac{V_{ff}}{Q_{ff}} = \frac{V_{ff}}{Q_{ff} \times 3600} = 26.06 \text{ HRS}$

26.06 HOURS > 24 HOURS - USE 7 - 2" DIA HOLES AT INV. 734.25

BANK FULL FLOW CONTROL CALCULATIONS

MINIMUM DETENTION TIME OF 36 HOURS

MAXIMUM DETENTION TIME OF 48 HOURS

$H_{avg} = \frac{2}{3} \times (Z_{bf} - Z_{bottom}) = 1.137 \text{ FT}$

$Q_1 = \text{No. of Holes} \times A_{1"} \times 0.62 \sqrt{2 \times g \times h} = 0.8100 \text{ CFS}$

TOTAL TIME TO RELEASE BF VOLUME THROUGH FF CONTROL

$T_{ff} = \frac{V_{bf}}{Q_1} = \frac{V_{bf}}{Q_1 \times 3600} = 37.294 \text{ HOURS TO DRAIN BF THROUGH FF CONTROL}$

48hrs > 37.3hrs > 24hrs

OUTLET CONTROL STRUCTURE ORIFICE CALCULATIONS

100-YEAR FLOOD CONTROL CALCULATIONS

Qa (ALLOWABLE) = 3.036 CFS

FLOW THROUGH FF CONTROL ORIFICES

$H_{total} = (Z_{100} - Z_{bottom}) = 4.334 \text{ FT}$

$Q_1 = \text{No. of Holes} \times A_{1"} \times 0.62 \sqrt{2 \times g \times h} = 1.582 \text{ CFS}$

FLOW THROUGH BF CONTROL ORIFICES

$H_{avg} = \frac{2}{3} (Z_{100} - Z_{ff}) = 2.337 \text{ FT}$

$Q_2 = \text{No. of Holes} \times A_{1"} \times 0.62 \sqrt{2 \times g \times h} = 0.000 \text{ CFS}$

MAXIMUM ALLOWABLE FLOW FROM 100-YR

$Q_{100max} = Q_a - (Q_1 + Q_2) = 1.454$

2" DIA HOLE HAS AN AREA OF

$A_{1"} = 0.167 = 0.0218 \text{ SF} = \text{NOMINAL HOLE AREA}$

HOLES AT BF VOLUME ELEVATION

$H_{100max} = (Z_{100} - Z_{bf}) = 2.6297$

$A_{100max} = \frac{Q_{100max}}{0.62 \sqrt{2 \times g \times (Z_{100} - Z_{bf})}} = 0.180$

NUMBER OF HOLES = $\frac{A_{100}}{\text{NOMINAL HOLE AREA}} = 8.26$

ROUNDED TO: 8 - 2" DIA. HC

CHECK ALLOWABLE FLOW NOT EXCEEDED

$Q_{ff} + Q_{bf} + \text{No. of Holes} \times A_{100max} \times 0.62 \sqrt{2 \times g \times h_{ave}^{all}} = 2.37 < 3.036 \text{ CFS}$

Qall (DISCHARGE THROUGH THE FIRST FLUSH ORIFICES WHEN FIRST FLUSH, BANFULL, AND 100-YR HOLES ARE CONTRIBUTING)

$h_{ave}^{all} = \frac{2}{3} (Z_{100} - Z_{bf}) + (Z_{bf} - Z_{bottom}) = 3.46$

$Q_{all} = \text{No. of ff Holes} \times A_{ff} \times 0.62 \sqrt{2 \times g \times h_{ave}^{all}} = 1.41$

Qbf+100 (DISCHARGE THROUGH 100-YR ORIFICES WHEN FIRST FLUSH, BANKFULL, AND 100-YR ARE CONTRIBUTING)

$h_{100ave} = \frac{2}{3} (Z_{100} - Z_{bf}) = 1.75$

$Q_{100} = \text{No. of 100yr Holes} \times A_{100} \times 0.62 \sqrt{2 \times g \times h_{100ave}} = 9.50$

100-YR TIME OF RELEASE

$V_{rem} = V_{100} - V_{bf} = 182786 \text{ CF}$

$T_{100} = V_{ff} + \frac{V_{rem}}{(Q_{all} + \frac{V_{rem}}{T_{100}}) \times 3600} = 41.95 < 72 \text{ hrs}$

USE 8 - 2" DIA HOLES AT INV. 735.95

FOREBAY OUTLET CONTROL CALCULATIONS

FIRST FLUSH CONTROL CALCULATIONS

MINIMUM DETENTION TIME OF 24 HOURS

$Q_{ff} = \frac{V_{ff}}{T_{24}} = \frac{V_{ff}}{24 \times 3600} = 0.613 \text{ CFS}$

OPENINGS IN BOTTOM OF FOREBAY

$Z_{bottom} = 734.40$

$H_{avg} = \frac{2}{3} \times (Z_{ff} - Z_{bottom}) = 0.453 \text{ FT}$

$A_{ff} = \frac{Q_{ff}}{0.62 \sqrt{2 \times g \times H_{avg}}} = 0.183 \text{ SF}$

2" DIA HOLE HAS AN AREA OF

$A_{1"} = 0.167 = 0.0218 \text{ SF} = \text{NOMINAL HOLE AREA}$

NUMBER OF HOLES = $\frac{A_{ff}}{\text{NOMINAL HOLE AREA}} = 8.3972$

ROUNDED TO: 8 - 2" DIA. HOLES

DETENTION TIME FOR TEN (8) 2" DIA HOLES

$Q_{ff} = \text{No. of Holes} \times A_{1"} \times 0.62 \sqrt{2 \times g \times h} = 0.5842 \text{ CFS}$

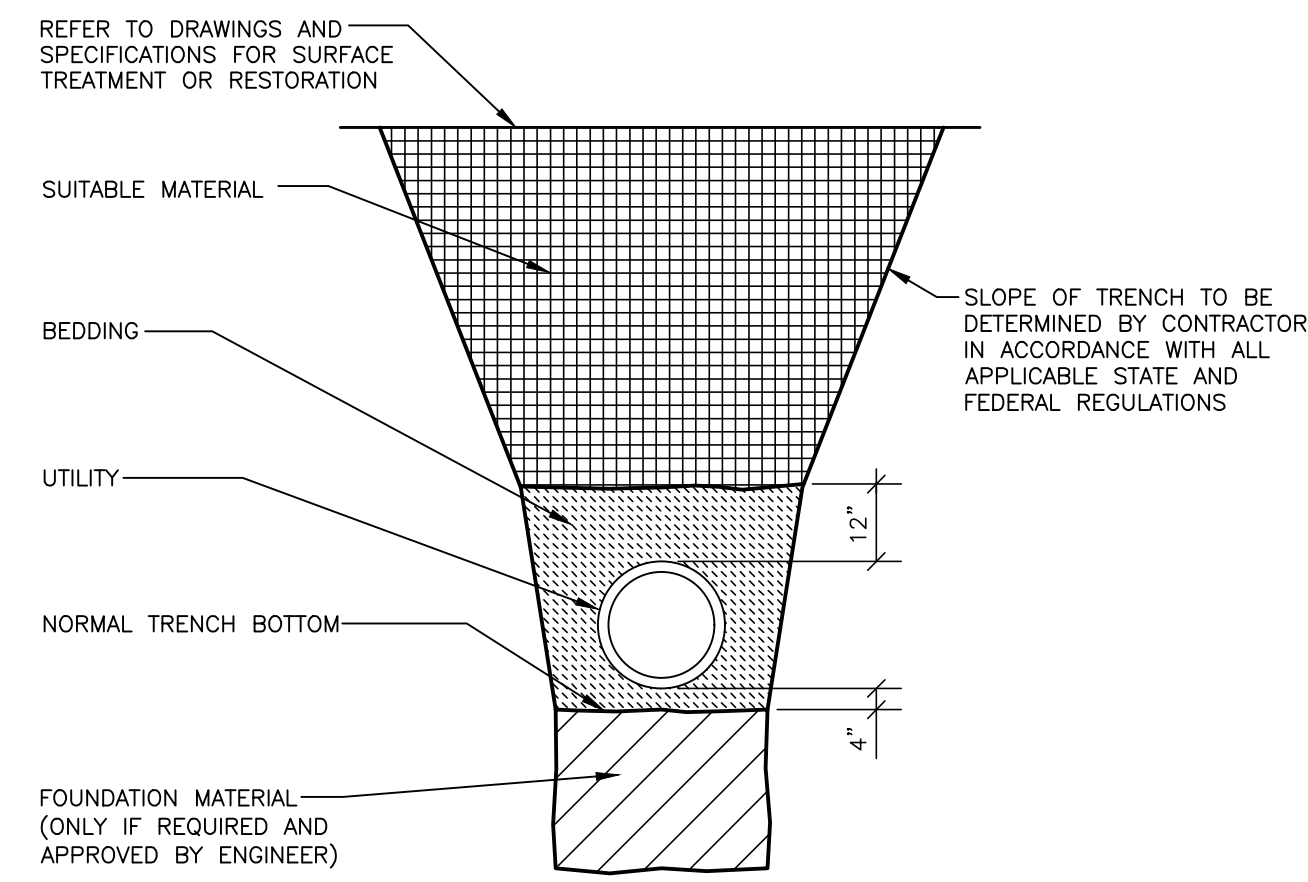
$T_{ff} = \frac{V_{ff}}{Q_{ff}} = \frac{V_{ff}}{Q_{ff} \times 3600} = 25.19 \text{ HRS}$

48 HOURS > 25.2 HOURS < 24 HOURS USE 8 - 2" DIA HOLES AT INV. 734.40

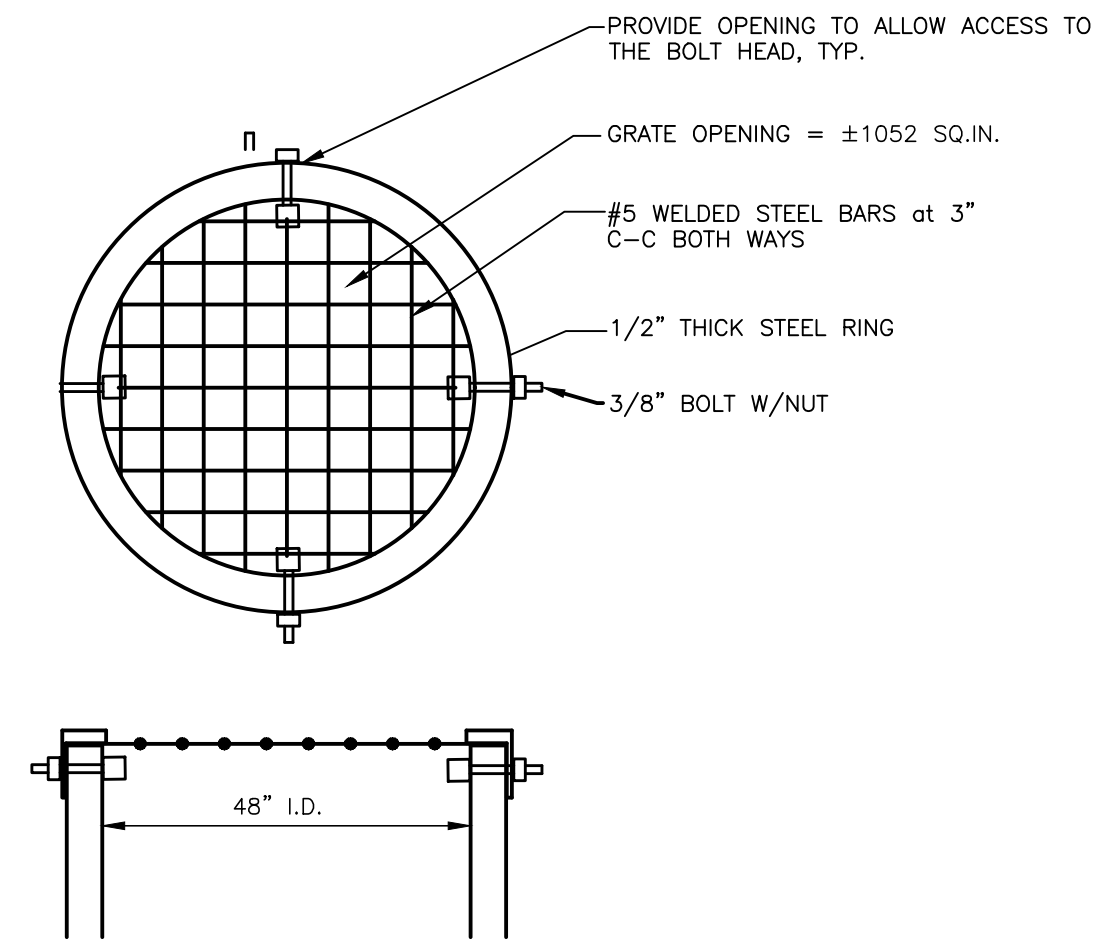
STORM SEWER CALCULATIONS

	FROM STR TO STR	AREA A	COEFF. C	A x C	AREA TOTAL At	TOTAL C x A	TIME t	INT. I	FLOW Q	PIPE CAP.	PIPE AREA	PIPE LENGTH	PIPE DIA.	PIPE SLOPE	MIN PIPE SLOPE	H.G. SLOPE	VEL. FULL	TIME FLOW	H.G. ELEV. UP STREAM	DOWN STREAM	INVERT ELEV. UP STREAM	DOWN STREAM	RIM ELEV. UP STREAM	RIM ELEV. DOWN STREAM
		ac.			sq ft		min.	in/hr	c.f.s.	c.f.s.	sq ft	ft	in.	%	%	ft/sec	min							
MAIN RUN	50050-50126	0.64	0.62	0.397	1,410	1,089	20.00	3.89	4.23	2.33	0.79	119	12	0.43	0.30	1.41	2.97	0.67	755.93	754.25	741.09	740.58	747.17	745.57
	50126-50000	0.31	0.61	0.190	3,330	2,636	21.12	3.79	10.00	3.14	0.79	128	12	0.78	0.30	7.89	4.00	0.53	754.25	744.13	740.58	739.58	745.57	746.95
	50000-50073	0.00	1.00	0.000	4,260	3,450	23.95	3.57	12.33	6.64	1.77	328	18	0.40	0.18	1.38	3.76	1.46	744.13	739.59	739.18	737.86	746.95	745.15
	50073-50006	0.00	1.00	0.000	4,430	3,594	25.41	3.47	12.48	14.30	3.14	100	24	0.40	0.12	0.40	4.55	0.37	739.59	739.19	737.46	737.06	745.15	744.50
	50006-50535	0.00	1.00	0.000	5,670	4,691	25.78	3.45	16.17	14.30	3.14	176	24	0.40	0.12	0.51	4.55	0.64	739.19	738.29	737.06	736.36	744.50	743.54
	50535-MH6	0.29	0.90	0.261	5,960	4,952	26.42	3.40	16.85	14.30	3.14	213	24	0.40	0.12	0.56	4.55	0.78	738.29	737.11	736.36	735.51	743.54	742.97
	MH6-ES7	0.00	1.00	0.000	5,960	4,952	27.20	3.35	16.60	17.72	3.14	115	24	0.44	0.09	0.44	5.64	0.34	737.11	736.60	735.51	735.00	742.97	734.40
LATERAL	50002-50003	0.32	0.79	0.253	0,320	0,253	20.00	3.89	0.99	0.36	0.79	65	12	0.01	0.30	0.08	0.45	2.39	745.18	745.13	737.48	737.47	743.81	743.96
	50003-50004	0.22	0.92	0.202	0,540	0,455	22.39	3.69	1.68	1.81	0.79	217	12	0.26	0.30	0.26	2.31	1.56	745.13	744.56	737.47	736.91	743.96	743.59
	50004-50073	0.39	0.92	0.358	0,930	0,814	23.95	3.57	2.91	5.42	0.79	19	12	2.32	0.30	2.32	6.91	0.05	744.56	744.13	736.91	736.47	743.59	745.15
LATERAL	10075-10076	0.52	0.83	0.433	0,520	0,433	20.00	3.89	1.68	1.50	0.79	51	12	0.18	0.30	0.22	1.91	0.44	755.76	755.64	738.45	738.36	743.95	744.12
	10076-10077	0.21	0.85	0.178	0,730	0,611	20.44	3.85	2.35	1.56	0.79	57	12	0.19	0.30	0.44	1.99	0.48	755.64	755.40	738.36	738.25	744.12	743.94
	10077-50001	0.11	0.84	0.092	0,840	0,703	20.92	3.81	2.68	1.78	0.79	28	12	0.25	0.30	0.57	2.27	0.20	755.40	755.24	738.25	738.18	743.94	744.04
	50001-50000	0.52	0.86	0.448	1,360	1,151	21.12	3.79	4.37	2.78	0.79	66	12	0.61	0.30	1.51	3.54	0.31	755.24	754.25	738.18	737.78	744.04	746.95
LATERAL	50005-50006	0.17	0.85	0.144	0,170	0,144	20.00	3.89	0.56	7.08	0.79	19	12	3.96	0.30	3.96	9.02	0.04	740.34	739.59	736.05	735.30	746.95	744.50
	11275-10206	0.45	0.87	0.392	0,450	0,392	20.00	3.89	1.53	1.78	0.79	76	12	0.25	0.30	0.25	2.27	0.56	740.28	740.09	736.97	736.78	743.67	743.63
	10206-11237	0.13	0.80	0.104	0,580	0,496	20.56	3.84	1.91	2.80	0.79	39	12	0.62	0.30	0.62	3.57	0.18	740.09	739.85	736.78	736.59	743.63	743.91
LATERAL	11357-11355	0.16	0.90	0.145	0,160	0,145	20.00	3.89	0.56	1.81	0.79	57	12	0.26	0.30	0.26	2.31	0.41	741.61	741.46	738.31	738.16	742.75	742.70
	11355-11346	0.30	0.90	0.271	0,460	0,415	20.41	3.85	1.60	2.04	0.79	57	12	0.33	0.30	0.33	2.60	0.37	741.46	741.27	738.16	737.97	742.70	743.34
	11346-11294	0.19	0.68	0.130	0,650	0,545	20.78	3.82	2.08	2.14	0.79	103	12	0.36	0.30	0.36	2.72	0.63	741.27	740.90	737.97	737.60	743.34	743.07
	11294-11292	0.32	0.83	0.267	0,812	0,711	21.41	3.77	3.06	1.28	0.79	142	12	0.13	0.30	0.74	1.63	1.45	740.90	739.85	737.60	737.41	743.07	743.94
	11292-11237	0.30	0.79	0.237	1,270	1,049	22.86	3.66	3.83	2.98	0.79	89	12	0.70	0.30	1.16	3.79	0.39	739.85	738.82	737.41	736.79	743.94	743.91
	11237-50073	0.12	0.77	0.093	1,390	1,141	23.25	3.63	4.14	1.88	0.79	115	12	0.28	0.30	1.35	2.40	0.80	738.82	737.27	736.79	736.47	743.91	745.15
LATERAL	11340-11346	0.13	0.92	0.119	0,130	0,119	20.00	3.89	0.46	4.37	0.79	90	12	1.51	0.30	1.51	5.57	0.27	742.82	741.46	740.02	738.66	743.94	743.34
LATERAL	10353-11298	0.09	0.74	0.067	0,090	0,067	20.00	3.89	0.26	2.59	0.79	108	12	0.53	0.30	0.53	3.30	0.54	744.69	744.12	740.00	739.43	743.13	743.11
	11298-50535	0.23	0.82	0.188	0,320	0,255	20.54	3.84	0.98	4.63	0.79	141	12	1.69	0.30	1.69	5.89	0.40	744.12	741.74	739.43	737.05	743.11	743.76
	11331-11325	0.50	0.93	0.464	0,820	0,719	20.94	3.81	2.74	2.54	0.79	83	12	0.51	0.30									

TRENCH DETAIL - NOT ADJACENT TO DRIVING SURFACE OR STRUCTURE

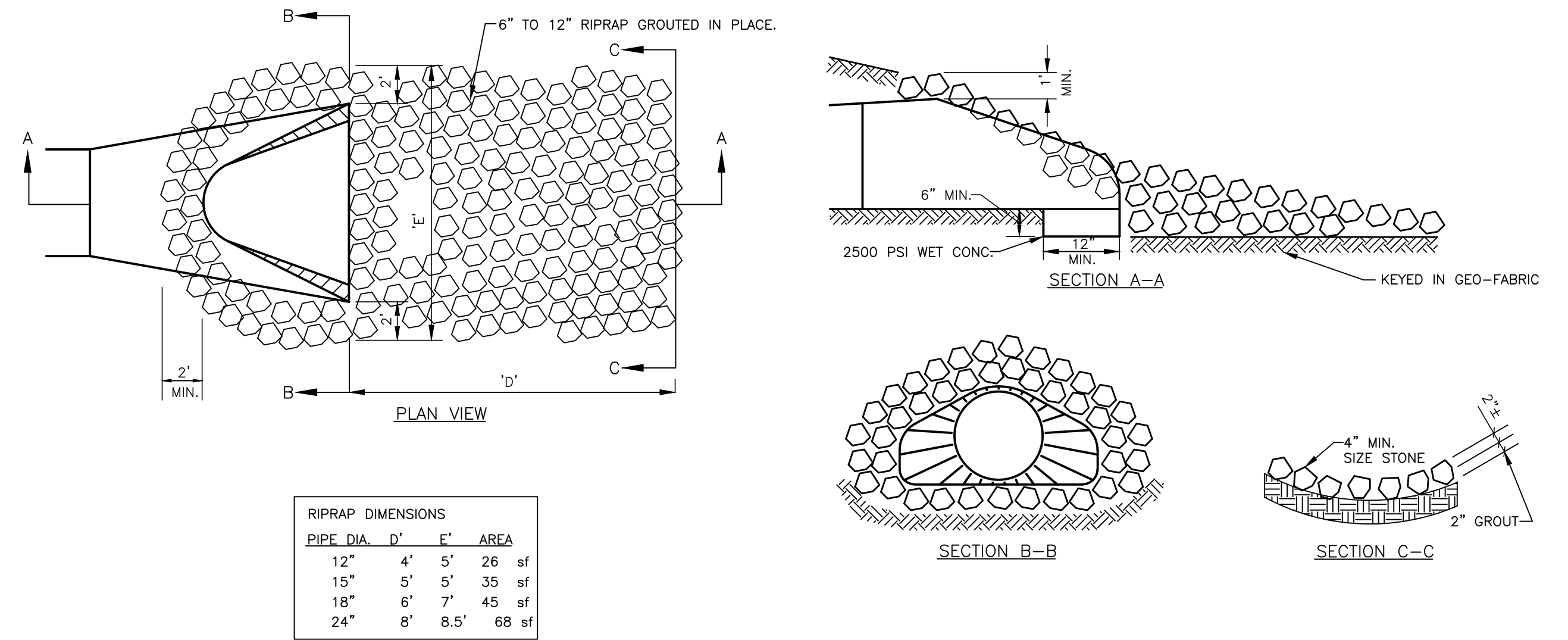


BAR GRATE DETAIL - FOR OUTLET CONTROL STRUCTURE



NOTE: BAR GRATE TO BE BOLTED TO STANDPIPE AS SHOWN

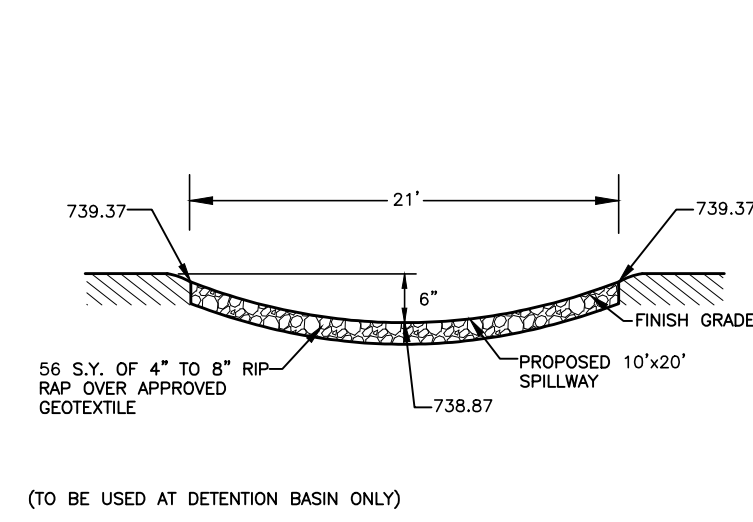
END SECTION DETAIL - WITH GROUTED RIPRAP



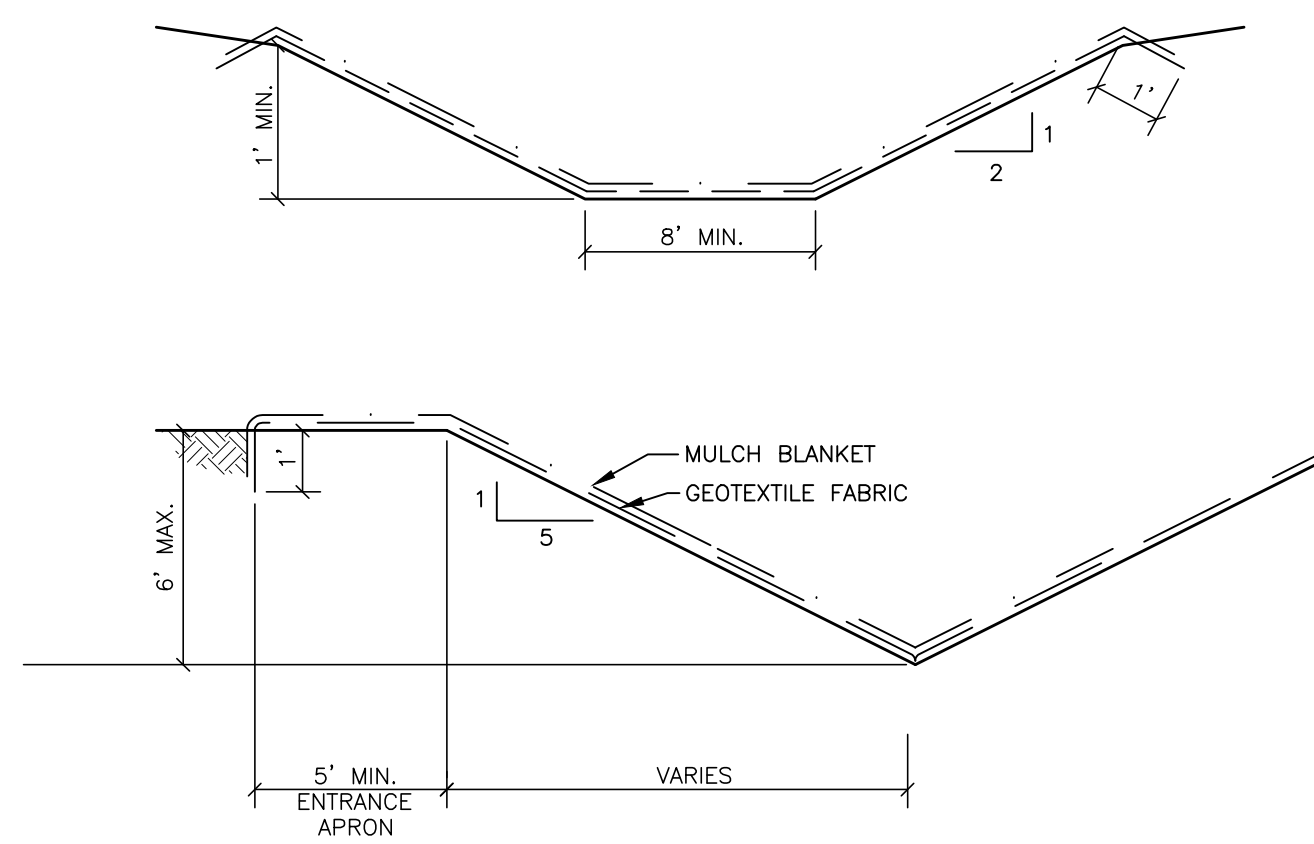
PIPE DIA.	D'	E'	AREA
12"	4'	5'	26 sf
15"	5'	5'	35 sf
18"	6'	7'	45 sf
24"	8'	8.5'	68 sf

NOTE: LENGTH OF CHANNEL PROTECT "D" FOR AND OUTLET END SECTION SHALL EQUAL 4X PIPE DIAMETER, OR EXTEND 4' BEYOND TOE OF SLOPE, WHICHEVER IS LONGER.

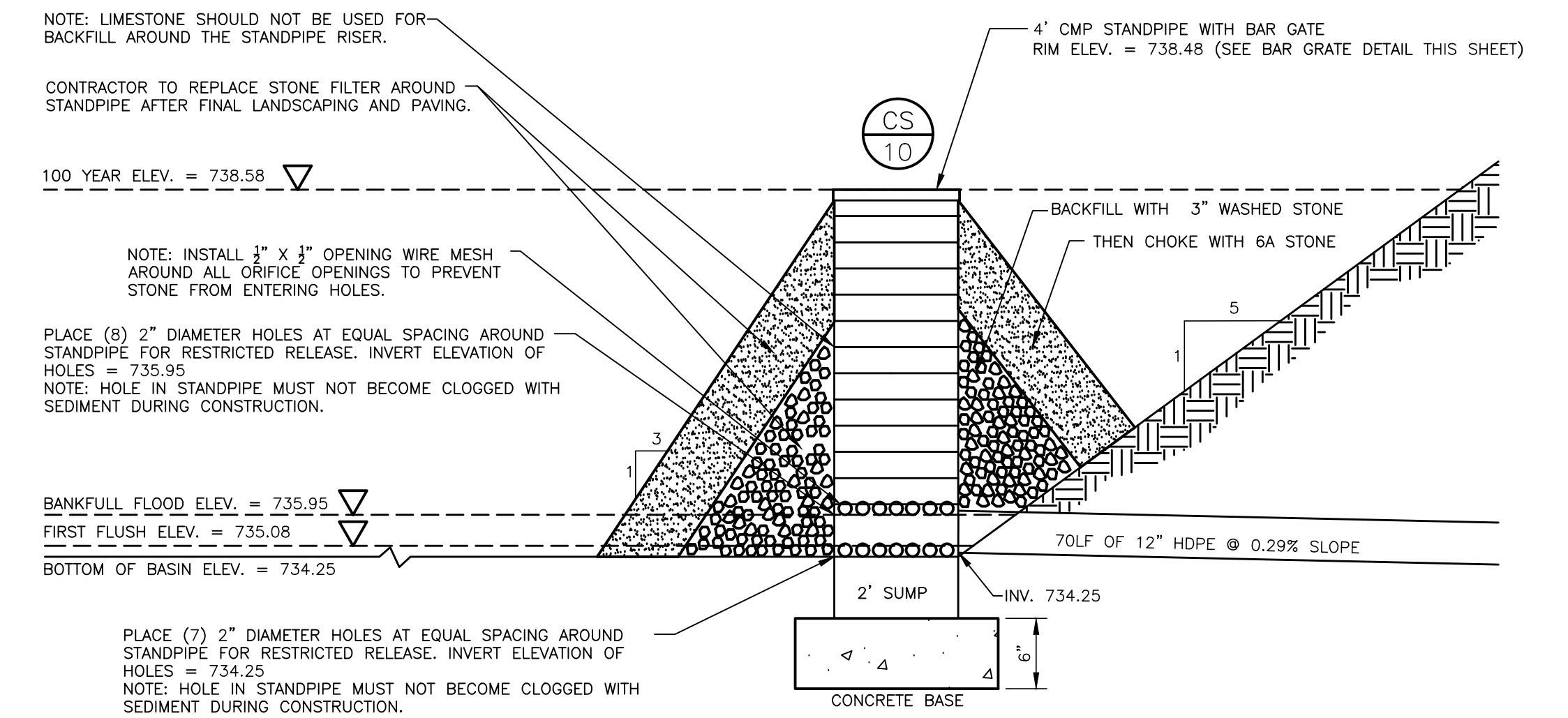
SPILLWAY DETAIL - OVERFLOW - RIP RAP - DETENTION POND



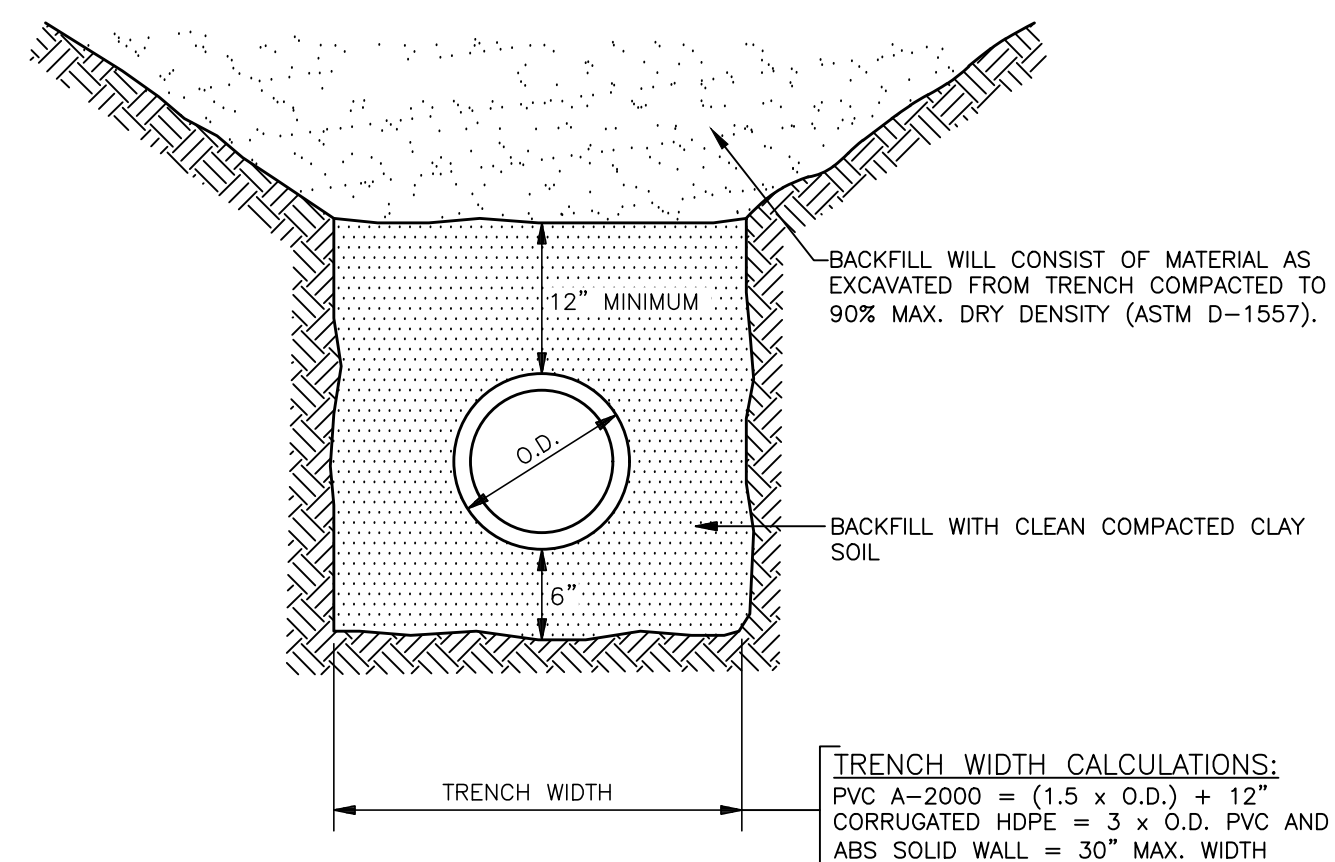
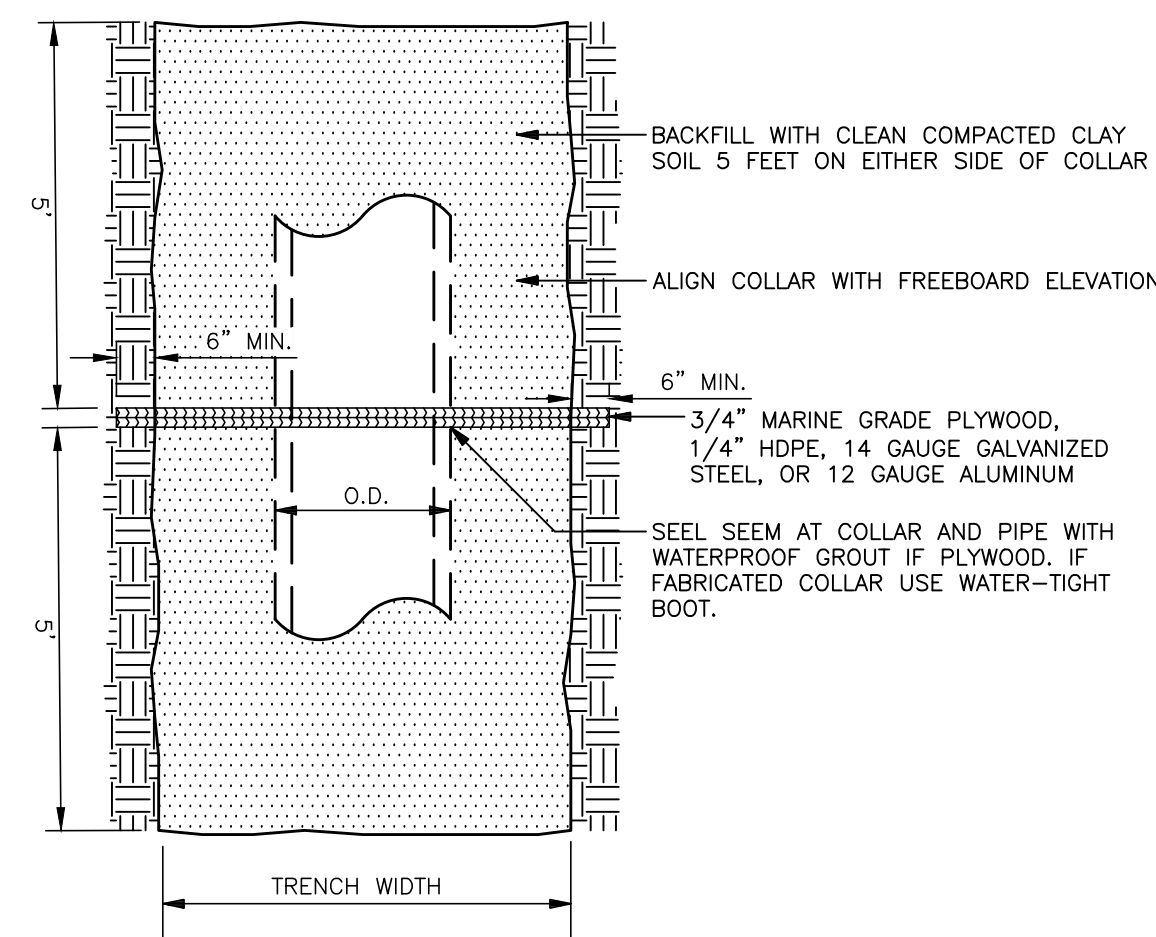
V-CHANNEL SPILLWAY DETAIL - VEGETATED SIDE INLET



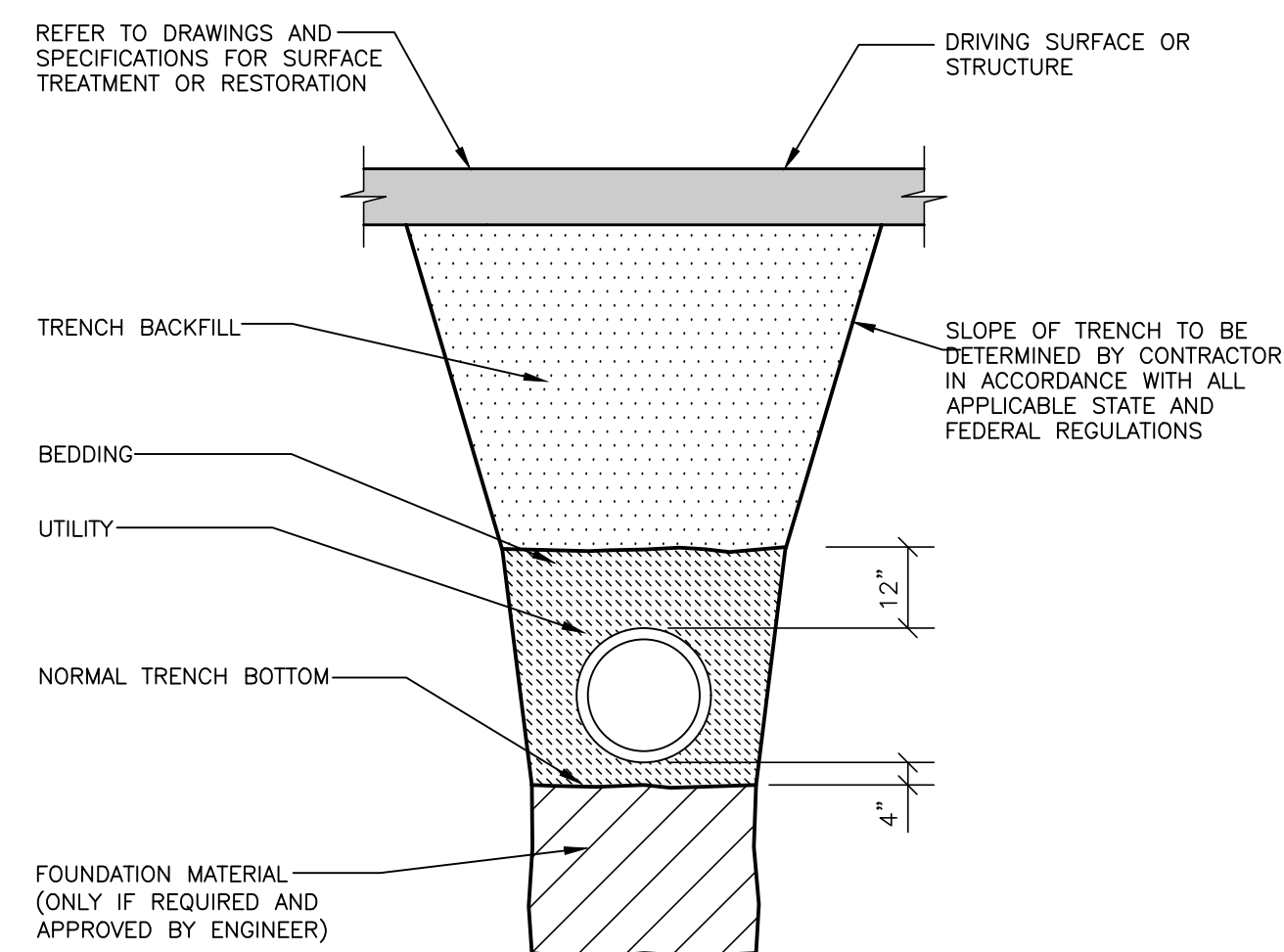
DETENTION BASIN OUTLET CONTROL STRUCTURE DETAIL



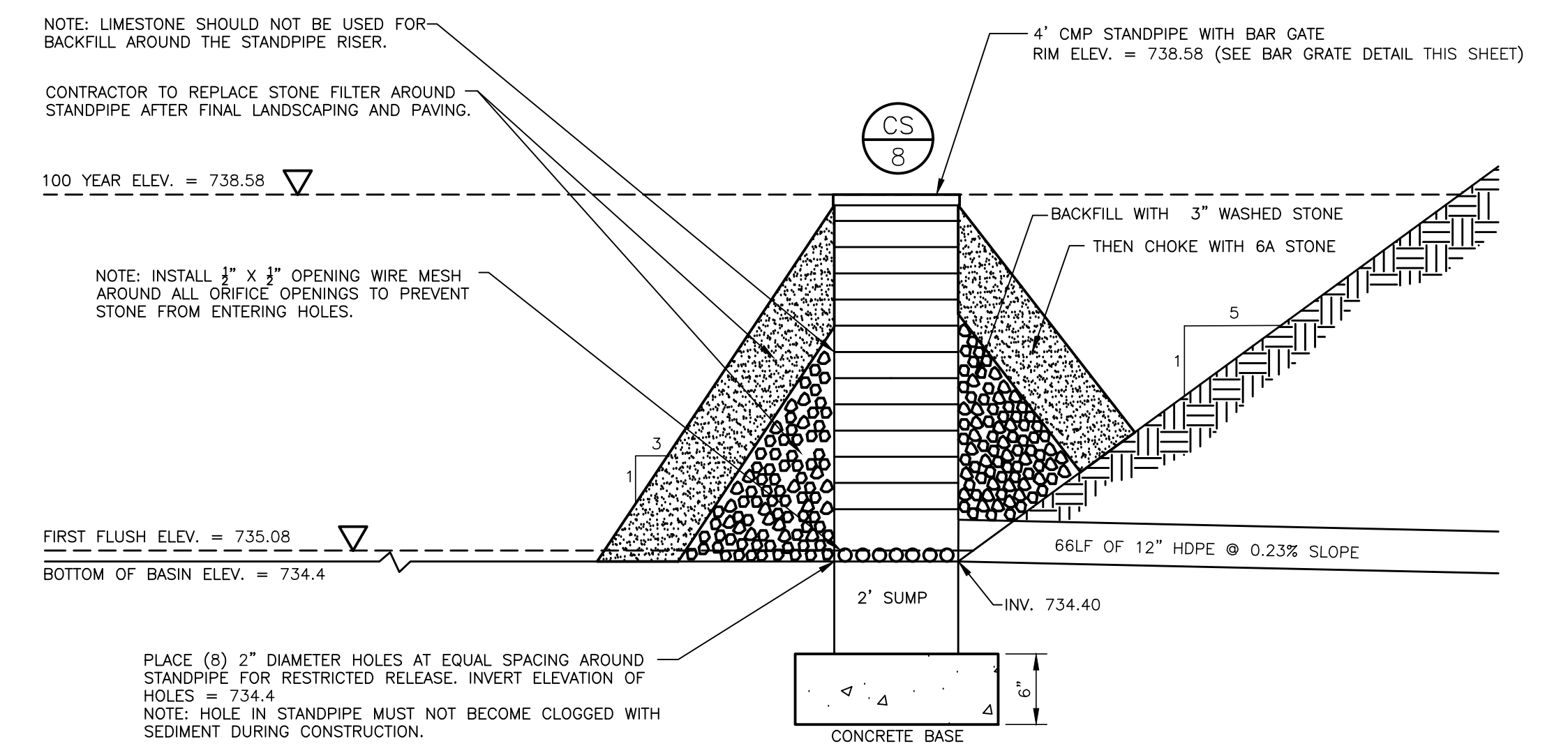
ANTI-SEEP COLLAR - 1' DIA.



TRENCH DETAIL - BELOW DRIVING SURFACE OR STRUCTURE



SEDIMENTATION BASIN OUTLET CONTROL STRUCTURE DETAIL



Stormwater

A wetland seed mix for saturated soils in a detention pond or for seeding a saturated basin, this mix will tolerate highly fluctuating water levels and poor water quality associated with urban stormwater wetlands and ponds. For detention basins that experience long, dry periods, use the Economy Prairie seed mix in the upper third to half of the basin area in combination with this mix. This seed mix includes at least 10 of 12 native permanent grass and sedge species and 13 of 17 native forb species. Apply at 38.22 PLS pounds per acre.

Botanical Name	Common Name	PLS D/Lb/Ac
<i>Andropogon furcatus</i>	Andropogon	1.00
<i>Bulboschoenus flavellus</i>	River Bulrush	1.00
<i>Carex cristata</i>	Crested Oval Sedge	0.50
<i>Carex lurida</i>	Bottlebrush Sedge	3.00
<i>Carex vulpinoidea</i>	Worm Fox Sedge	2.00
<i>Cymus virginicus</i>	Virginia Wild-Rye	24.00
<i>Dicentra atrata</i>	Forest Manna Grass	1.00
<i>Juncus effusus</i>	Common Rush	1.00
<i>Lernaea styriaca</i>	Rice Cut Grass	1.00
<i>Plantain virginicum</i>	Switch Grass	2.00
<i>Scheuchzeria palustris</i>	Great Bulrush	3.00
<i>Scirpus atrovirens</i>	Dark Green Rush	2.00
<i>Scirpus cyperinus</i>	Wood Grass	1.00
	Total	61.50
Temporary Cover		
<i>Avena sativa</i>	Common Oat	\$12.00
	Total	\$12.00
Forbs		
<i>Alisma subrotundum</i>	Common Water Plantain	2.00
<i>Asclepias incarnata</i>	Sweet Milkweed	2.00
<i>Bidens</i> spp.	Bidens Species	2.00
<i>Equisetum perfoliatum</i>	Common Horsetail	1.00
<i>Helianthus scaberrimus</i>	Sweetseed	2.00
<i>Iris virginica</i> v. <i>striata</i>	Blue Flag	4.00
<i>Lycopus americanus</i>	Common Water Horehound	0.50
<i>Milvula rigida</i>	Monkey Flower	1.00
<i>Phlox pilularis</i>	Diach Stonecrop	0.50
<i>Penstemon</i> spp.	Penstemon Species	2.00
<i>Rudbeckia hirta</i>	Sweet Black-Eyed Susan	1.00
<i>Rudbeckia missillia</i>	Brown-Eyed Susan	1.00
<i>Sagittaria latifolia</i>	Common Arrowhead	1.00
<i>Senna hebecarpa</i>	Wild Senna	2.00
<i>Symphoricarpos racemosa</i>	Hamamelis	0.50
<i>Symphoricarpos rose-anglica</i>	New England Aster	0.50
<i>Thalictrum dasycarpum</i>	Purple Meadow Rue	2.00
	Total	26.40

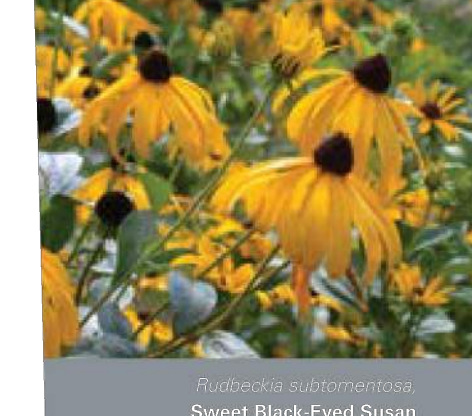
Specialty Seed Mixes



Carex cristata, Crested Oval Sedge



Milvula rigida, Monkey Flower



Rudbeckia hirta, Sweet Black-Eyed Susan

For current pricing, availability, and information on our full installation and management services, visit cardnonativeplantnursery.com

EXHIBIT B STORM WATER MANAGEMENT SYSTEM LONG-TERM MAINTENANCE PLAN

A. Physical Limits of the Storm Water Management System
The storm water management system (SWMS) subject to this long-term maintenance plan (Plan) is depicted on Exhibit A to the agreement and includes without limitation the storm sewers, swales, catch basins, manholes, inlets, detention basins, overflow structure, forebays, outlet pipe and spillway. For the purposes of this plan, this storm water management system and all of its components as shown in Exhibit A is referred to as "ARMY NATIONAL GUARD".

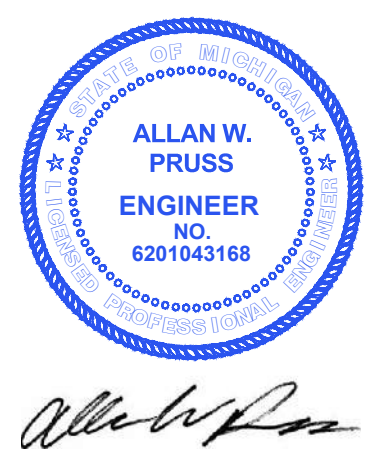
B. Time Frame for Long-Term Maintenance Responsibility
ARMY NATIONAL GUARD is responsible for maintaining the WASHTEENAW ARMORY site, including complying with applicable requirements of the local or Wayne County soil erosion and sedimentation control program until Wayne County releases the construction permit. Long-term maintenance responsibility for the WASHTEENAW ARMORY site commences upon execution of this agreement. Long-term maintenance continues in perpetuity.

C. Manner of Insuring Maintenance Responsibility
WASHTEENAW COUNTY retains the right to enter the property and perform the necessary maintenance of the WASHTEENAW ARMORY site if ARMY NATIONAL GUARD fails to perform the required maintenance activities. To ensure that the WASHTEENAW ARMORY site is maintained in perpetuity, the map of the physical limits of the storm water management system (Exhibit A), this plan (Exhibit B) and the maintenance agreement between the WASHTEENAW COUNTY and the property owner(s) will be recorded with the Wayne County Register of Deeds. Upon recording, a copy of the recorded documents will be provided to the County.

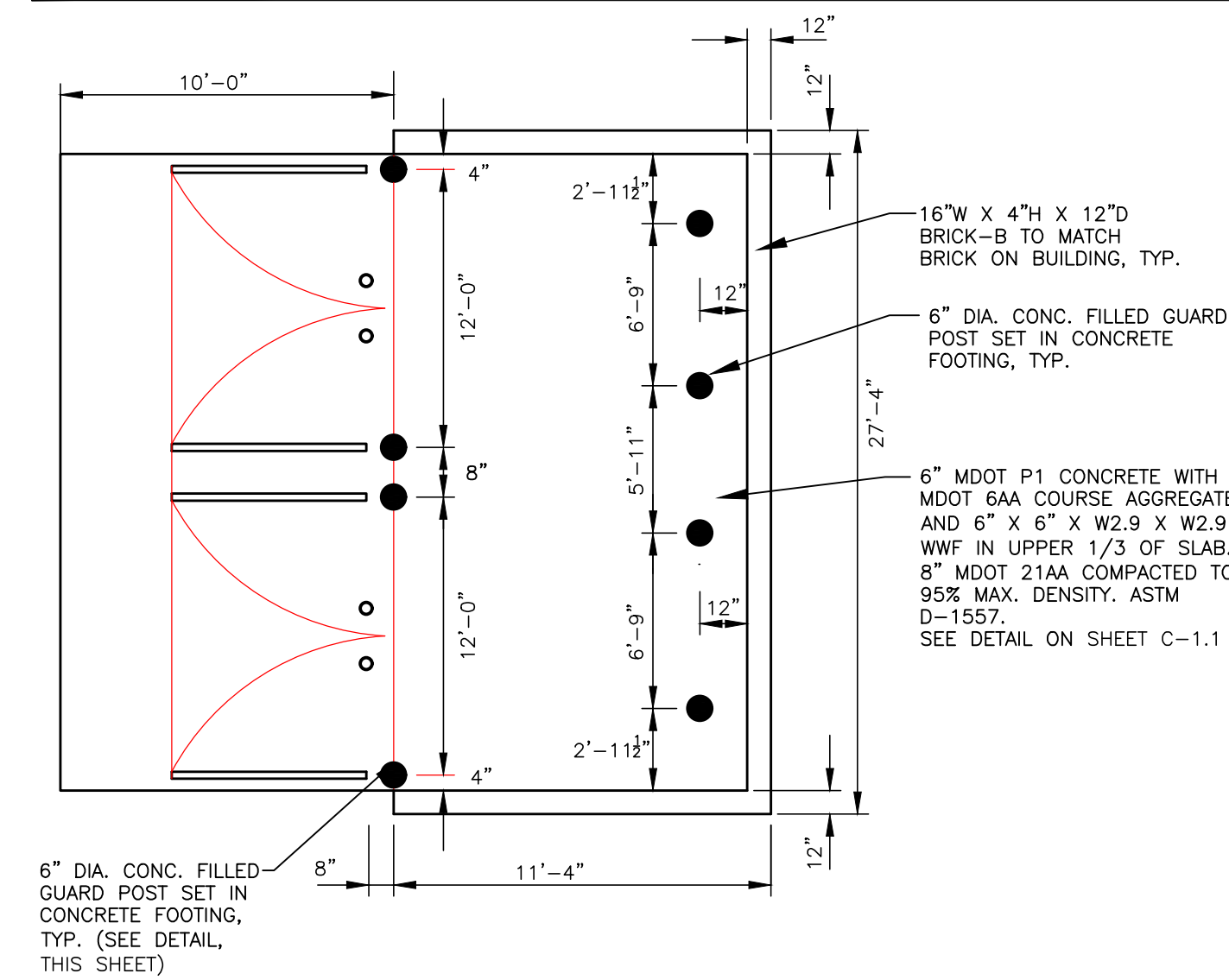
D. Long-Term Maintenance Plan and Schedule
Table 1 identifies the maintenance activities to be performed, organized by category (monitoring/inspections, preventative maintenance and remedial actions). While performing maintenance, chemicals should not be applied to the bioretention, buffer strip, or watercourses. Table 1 also identifies site-specific work needed to ensure that the storm water management system functions properly as designed.

MAINTENANCE ACTIVITIES	SYSTEM COMPONENTS										FREQUENCY
	CATCH BASINS, INLETS & STORM SEWERS	SWALES & VEGETATED SWALES	INLET TO PRE-TREATMENT SYSTEMS & DETENTION/RETENTION BASINS	FOREBOYS	OPEN DETENTION BASINS & RETENTION BASINS	OVERFLOW STRUCTURES & OUTLET PIPES	EMERGENCY SPILLWAYS	BRIDGES	BUFFER STRIP	PAVEMENT AREA	
MONITORING/INSPECTION											
INSPECT FOR SEDIMENT ACCUMULATION	x	x	x							x	ANNUALLY
INSPECT FOR FLOATABLES, DEAD VEGETATION AND DEBRIS	x	x	x							x	ANNUALLY AND AFTER MAJOR EVENTS
INSPECT FOR EROSION AND INTEGRITY OF BANKS & BERMS	x										ANNUALLY AND AFTER MAJOR EVENTS
INSPECT COMPONENTS DURING WET WEATHER AND COMPARE TO AS-BUILT PLANS	x	x	x							x	ANNUALLY
MONITOR PLANTINGS/VEGETATION											
ENSURE MAINTENANCE ACCESS REMAINS OPEN/CLEAR	x	x	x							x	ANNUALLY
PREVENTATIVE MAINTENANCE											
MOWING											UP TO 2 TIMES PER YEAR, SELECT AREAS ONLY
REMOVE ACCUMULATED SEDIMENTS	x	x								x	AS NEEDED, SELECT AREAS ONLY
REMOVE FLOATABLES, INVASIVE & DEAD VEGETATION AND DEBRIS	x	x	x							x	AS NEEDED
REPLACE OR WASH/REUSE STONE RISER FILTERS			x								EVERY 3 YEARS, MORE FREQUENTLY AS NEEDED
REMOVE INVASIVE PLANT SPECIES											ANNUALLY
REMEDIAL ACTION											
REPAIR/STABILIZE AREAS OF EROSION			x								AS NEEDED
REPLACE DEAD PLANTINGS, BUSHES & TREES											AS NEEDED
RESEED BARE AREAS											AS NEEDED
STRUCTURAL REPAIRS	x	x	x							x	AS NEEDED
MAKE ADJUSTMENTS/REPAIRS TO ENSURE PROPER FUNCTIONING	x	x	x							x	AS NEEDED
PROPERTY INFORMATION: 7400 S HURON RIVER DRIVE		PROPERTY OWNER: ARMY NATIONAL GUARD 7400 S HURON RIVER DR		ENGINEER: MEGA 298 VETERANS DRIVE FOWLERVILLE, MI 48836 PHONE: (517) 223-3512		DATE: 07/15/22					
SHEET: 2 OF 2											

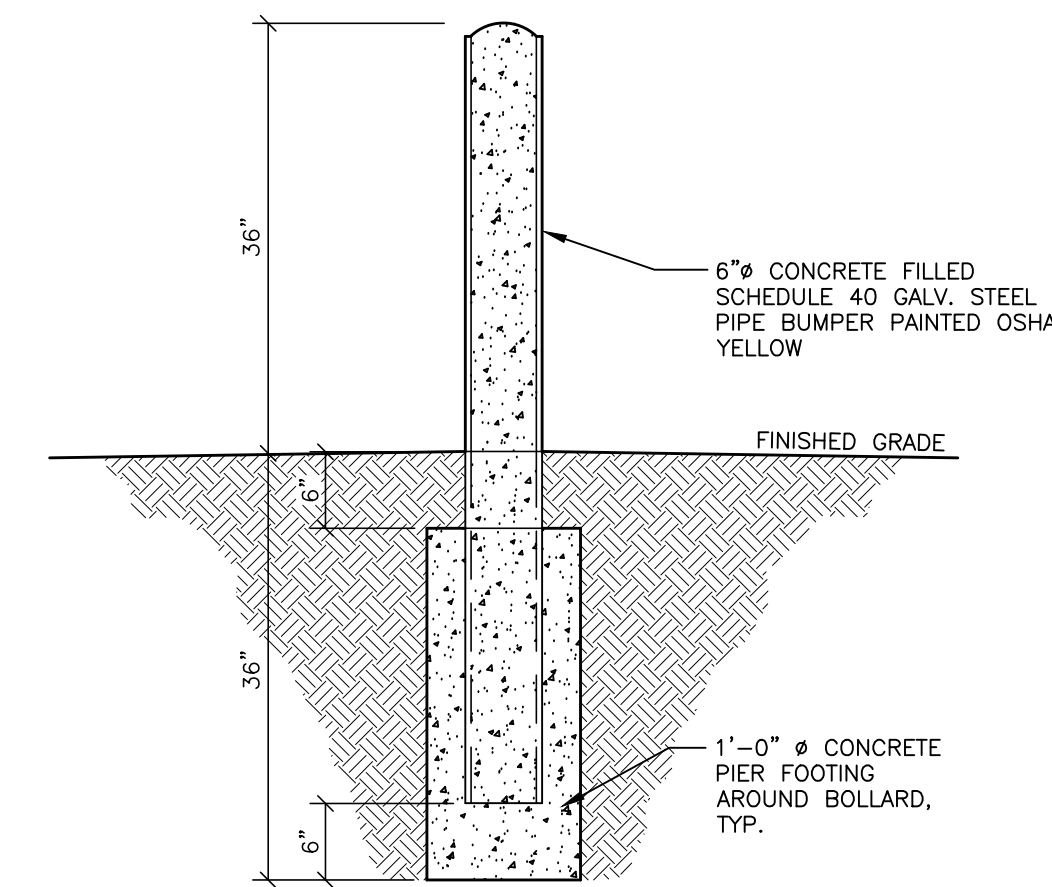
MEGA PROJ. # XX-XXX
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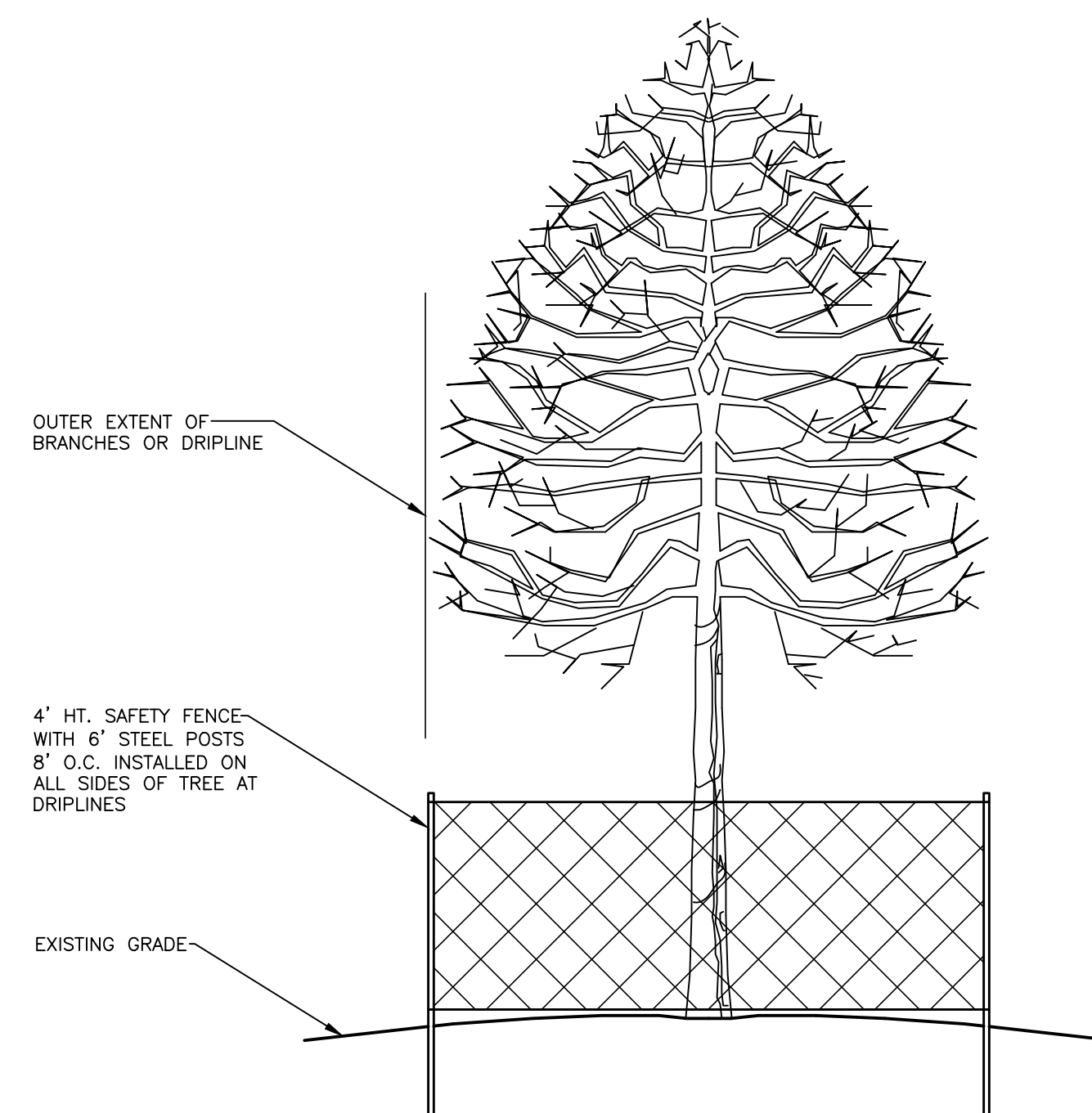
TRASH ENCLOSURE DETAIL - BRICK WALL - DOUBLE - PLAN VIEW



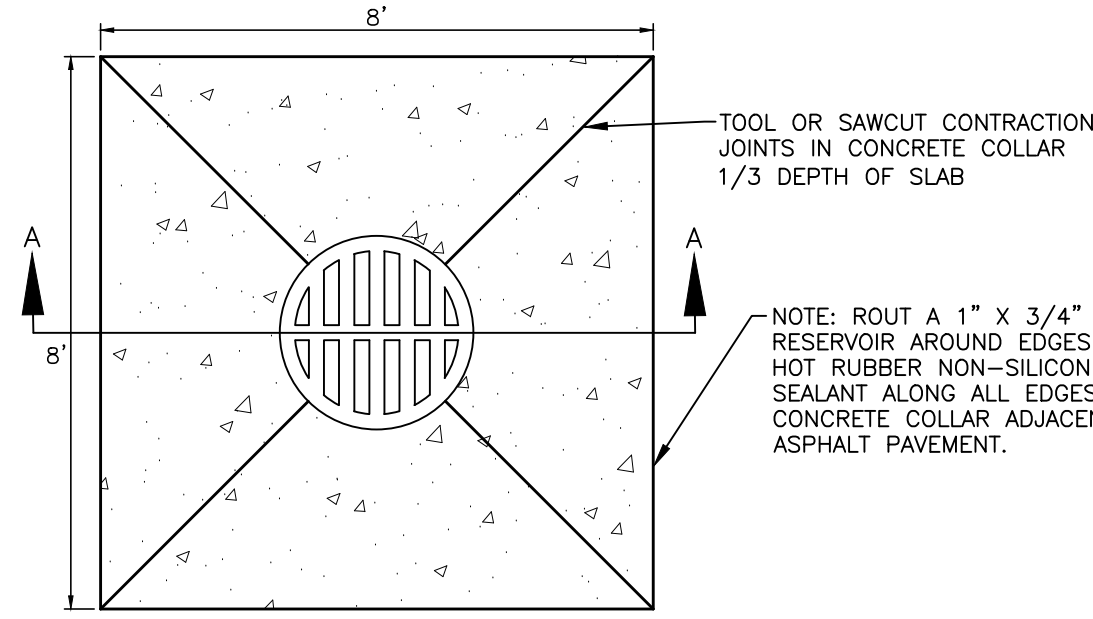
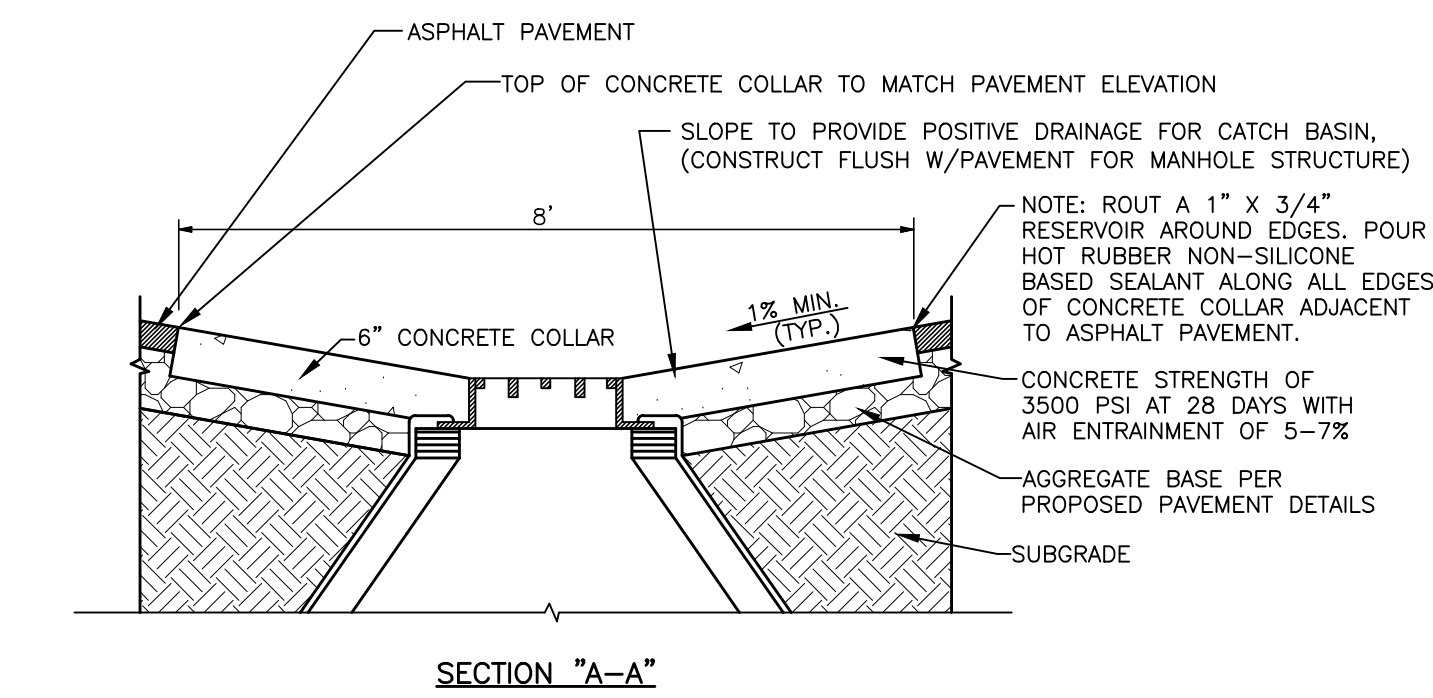
BOLLARD DETAIL - STEEL PIPE



FENCE DETAIL - TREE PROTECTION



APRON DETAIL - CONCRETE AROUND CATCH BASIN



**FREESTANDING SERIES BLOCKS
(FINISHED ON TWO SIDES)**

<p>Straight Top (Smooth or Textured) Full Block (46 1/8") Volume = 10.46 cft Weight = ±1496 lbs Half Block (23 7/16") Volume = 5.22 cft Weight = ±747 lbs</p>	<p>Curved Top (Smooth or Textured) Volume = 10.03 cft Weight = ±1434 lbs</p>
<p>Straight Top Garden Full Block (46 1/8") Volume = 7.98 cft Weight = ±1141 lbs Half Block (23 7/16") Volume = 3.97 cft Weight = ±567 lbs</p>	<p>Curved Top Garden Volume = 7.65 cft Weight = ±1093 lbs</p>
<p>Straight Middle Full Block (46 1/8") Volume = 10.68 cft Weight = ±1527 lbs Half Block (23 7/16") Volume = 5.33 cft Weight = ±762 lbs</p>	<p>Curved Middle Volume = 10.24 cft Weight = ±1465 lbs</p>
<p>Straight Bottom Full Block (46 1/8") Volume = 11.53 cft Weight = ±1649 lbs Half Block (23 7/16") Volume = 5.74 cft Weight = ±821 lbs</p>	<p>Curved Bottom Volume = 11.10 cft Weight = ±1588 lbs</p>
<p>Force Protection Straight blocks can be manufactured with a 3" horizontal tube for post-tensioned cable installation. Straight and curved blocks can be manufactured with 6" vertical tubes for mechanical tie-down bolt installation.</p>	<p>Variable Radius Walls Straight block styles can be manufactured with the end block insert to allow the blocks to be used in a variable radius wall.</p>

NOTES:
Architectural faces on the blocks have varying texture. Volumes are based on the blocks as shown. Actual weights and volumes may vary. Weight shown is based on 143 pcf concrete.

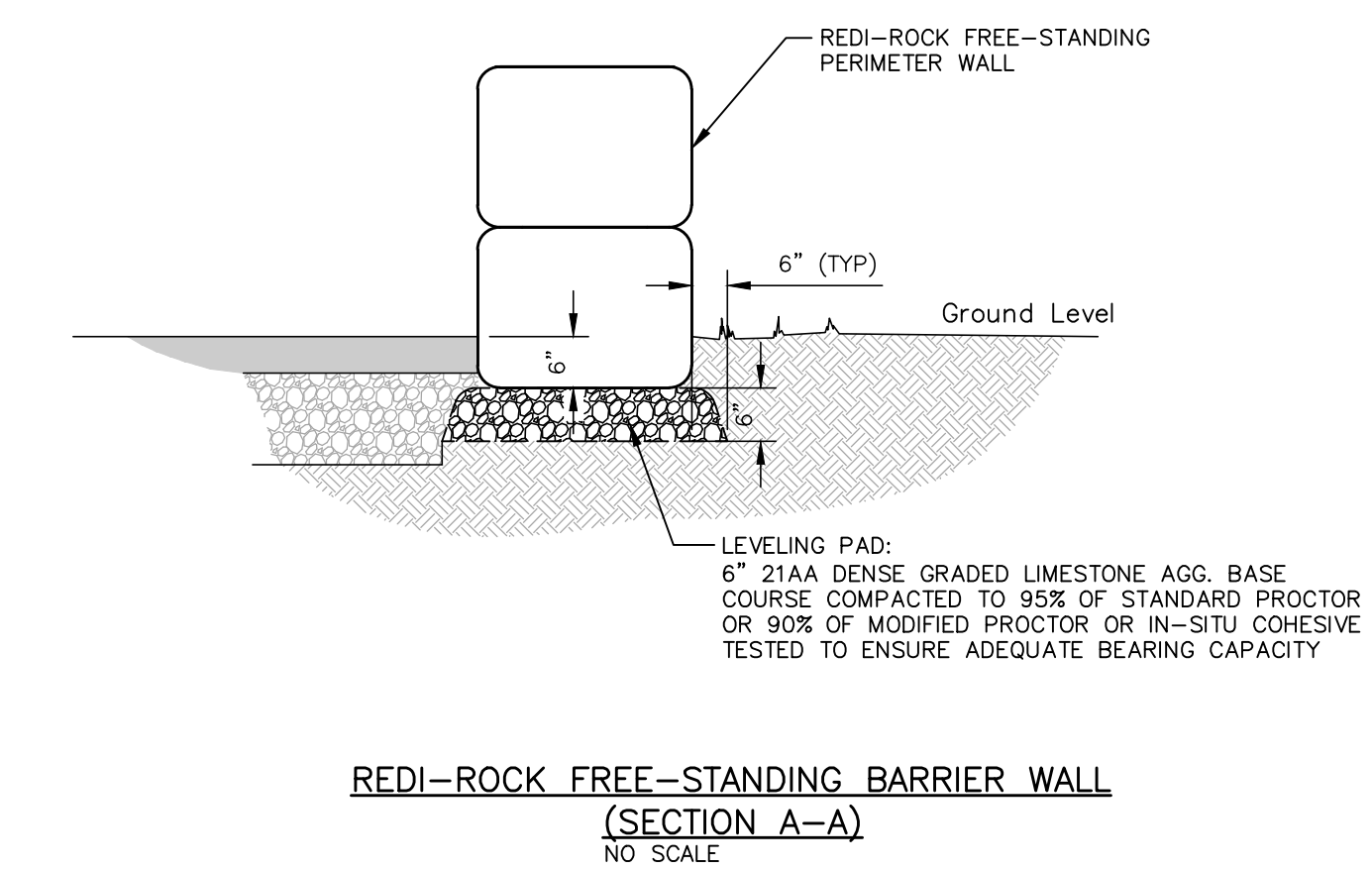
DRAWN BY	J. JOHNSON	03/18/10	Redi-Rock® International, LLC
CHECKED BY			
APPROVED BY			
ISSUE DATE			
DRAWING FILE	FS Series Blocks 031810.dwg	REVISION	
SCALE	NO SCALE	SHEET NO.	1 OF 1

**FREESTANDING SERIES CORNERS
(FINISHED ON THREE SIDES)**

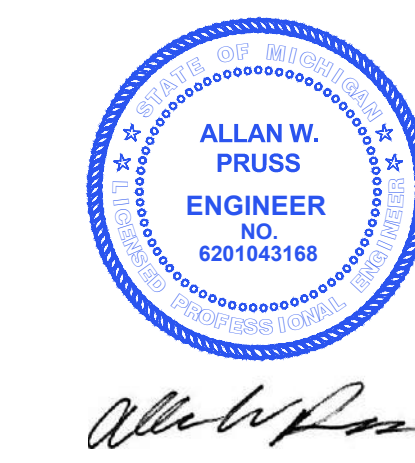
<p>Top Corner (Smooth or Textured) Volume = 10.44 cft Weight = ±1493 lbs</p>	<p>Half Top Corner (Smooth or Textured) Volume = 5.18 cft Weight = ±741 lbs</p>
<p>Garden Corner Volume = 8.26 cft Weight = ±1182 lbs</p>	<p>Half Garden Corner Volume = 4.25 cft Weight = ±607 lbs</p>
<p>Middle Corner Volume = 10.73 cft Weight = ±1534 lbs (Bottom Corner Block does not have groove)</p>	<p>Half Middle Corner Volume = 5.28 cft Weight = ±755 lbs (Half Bottom Corner Block does not have groove)</p>

NOTES:
Architectural faces on the blocks have varying texture. Volumes are based on the blocks as shown. Actual weights and volumes may vary. Weight shown is based on 143 pcf concrete.

DRAWN BY	J. JOHNSON	10/05/09	Redi-Rock® International, LLC
CHECKED BY			
APPROVED BY			
ISSUE DATE			
DRAWING FILE	FS Series Corners 100509.dwg	REVISION	
SCALE	NO SCALE	SHEET NO.	1 OF 1

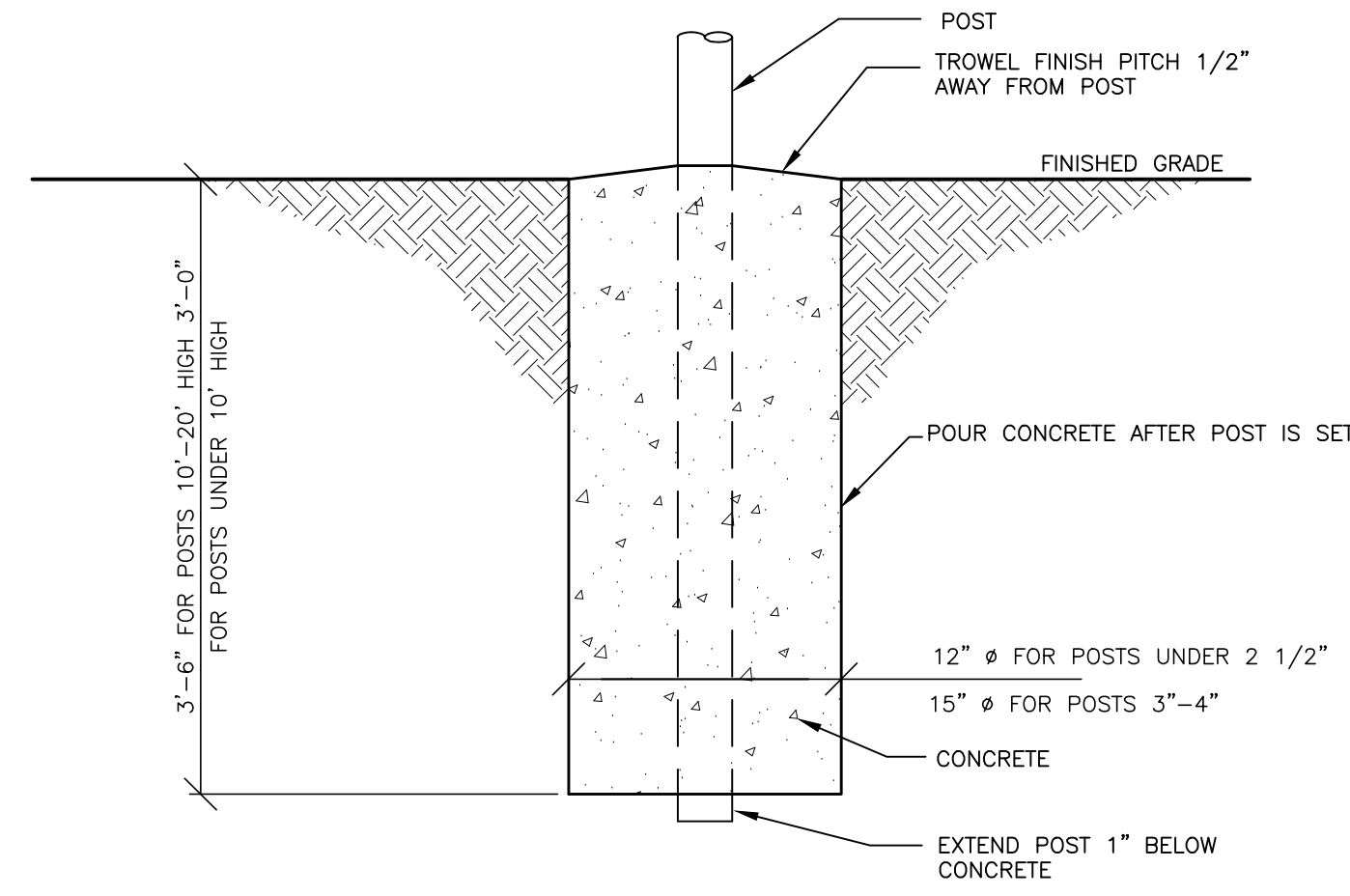


**REDI-ROCK FREE-STANDING BARRIER WALL
(SECTION A-A)
NO SCALE**

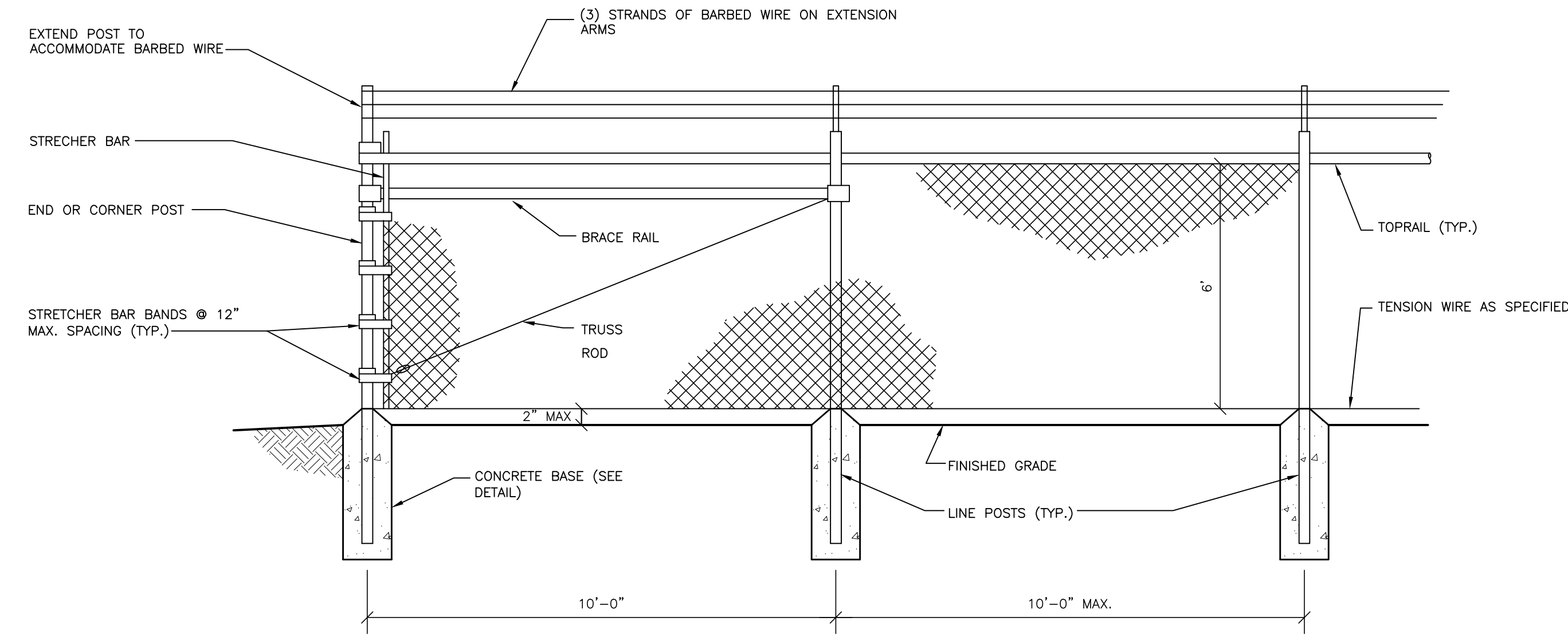


STATE OF MICHIGAN
 DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
 PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
 ADAM P. LACH, RA, DIRECTOR
 PROJECT: WASHINGTON ARMYORY - CONSTRUCTION
 WASHINGTON ARMYORY ADDITION
 DESIGNED: DT
 DRAWN: TDS
 CHECKED: TDS
 APPROVED: I. SCHERWITZ
 DATE: 04/01/2022
 ISSUED FOR: CONSTRUCTION DOCUMENTS
 IDENTIFICATION NUMBER: PROJECT: WASHINGTON ARMYORY CONTRACT NUMBER: 121456 FILE NO. 511/21326.CAK DWG PROJECT NO. 2463822016
 SHEET NUMBER: 17 OF 96
 DRAWING TITLE: DETAILS
 C-11.0

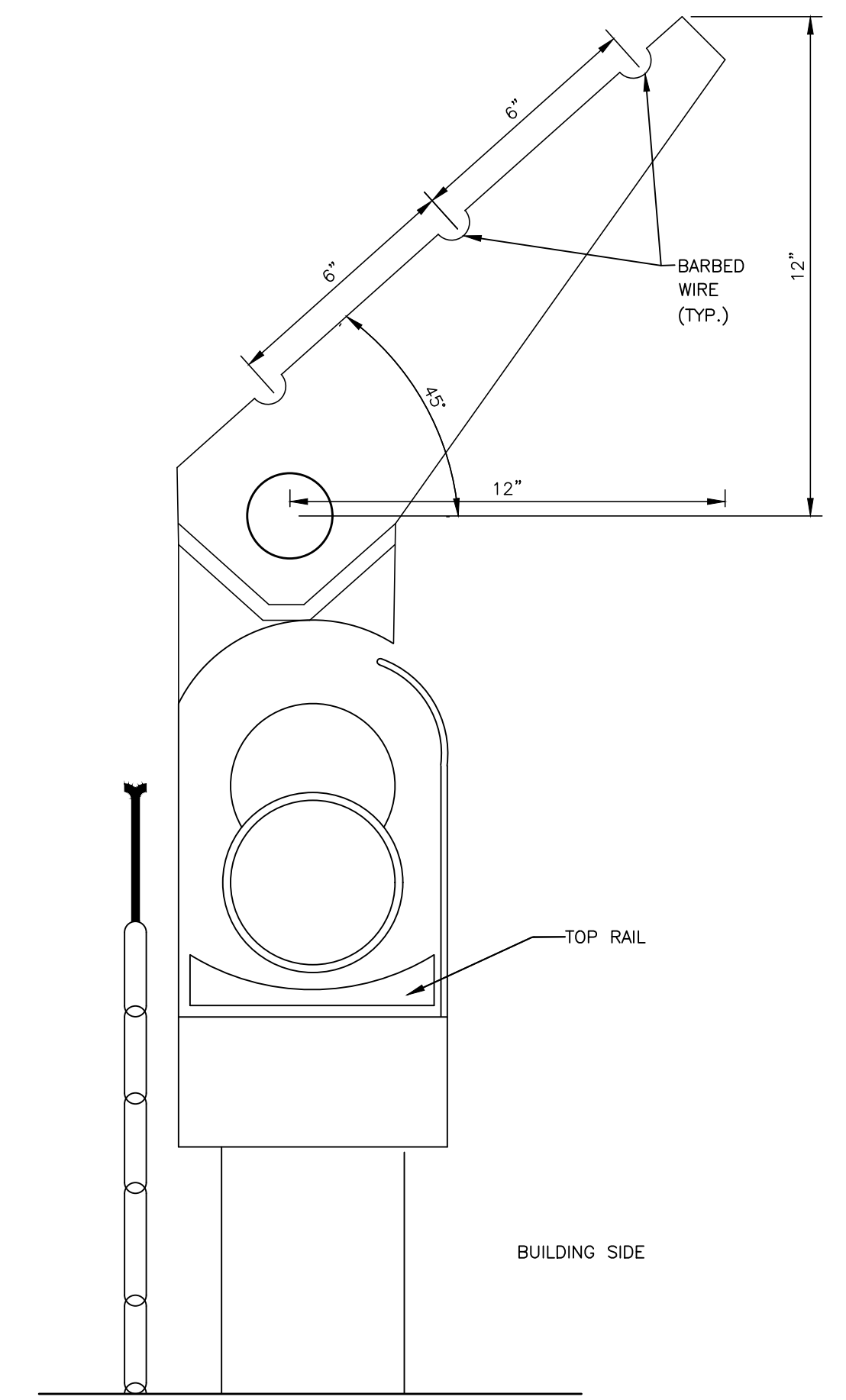
FENCE DETAIL - POST SUPPORT



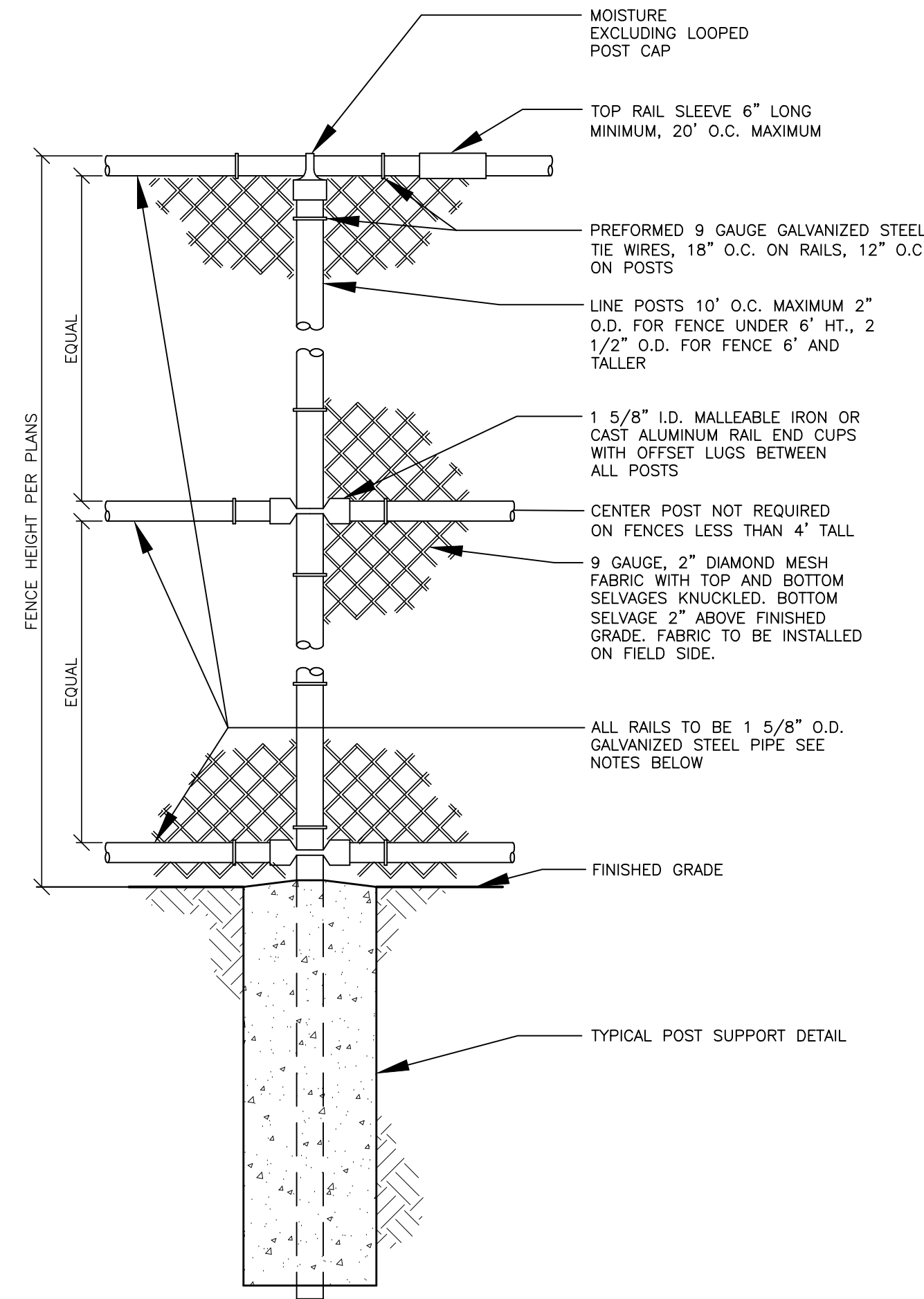
FENCE DETAIL - CHAIN LINK - STRAIGHT SEGMENT



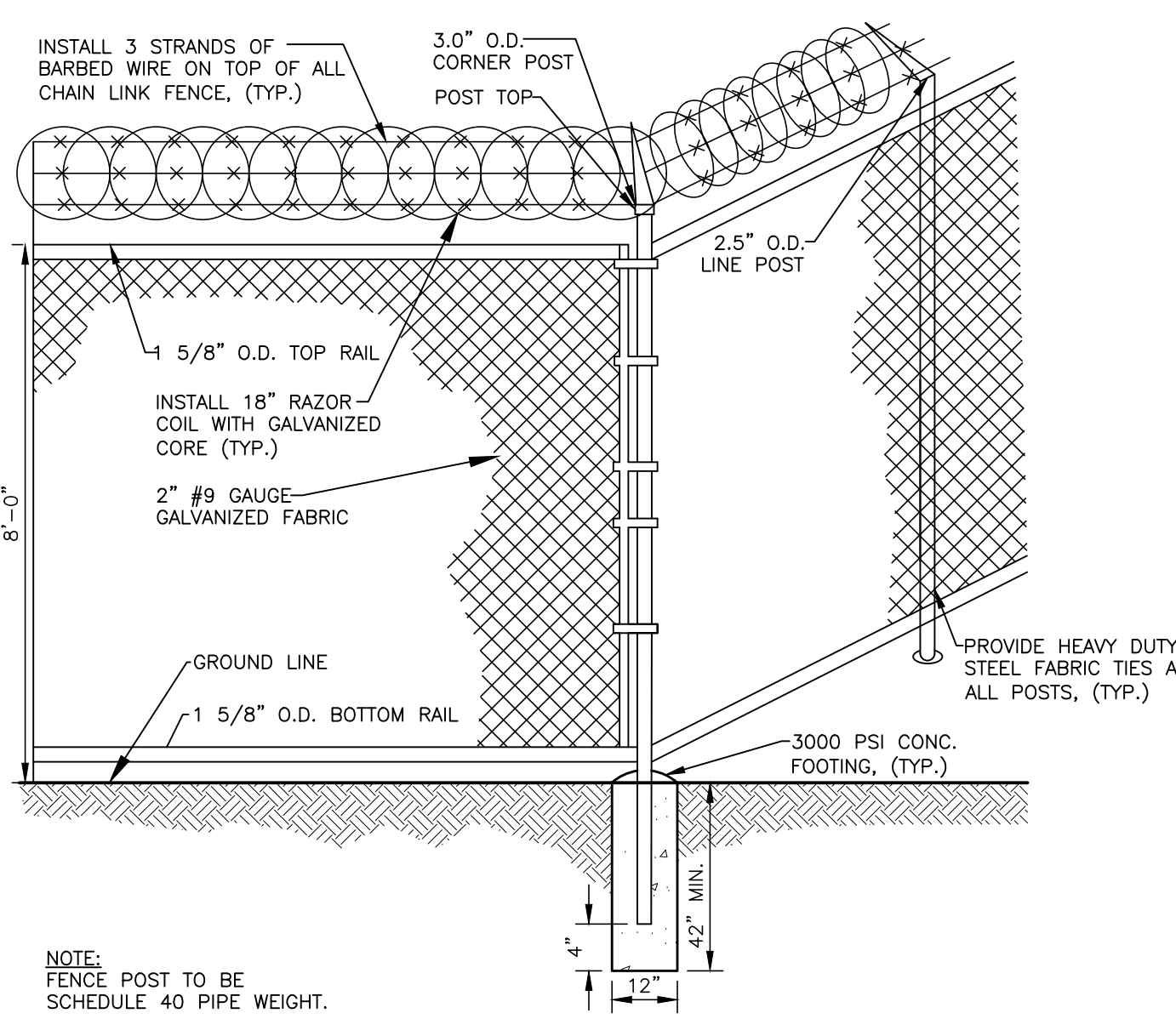
FENCE DETAIL - BARBED WIRE ARM



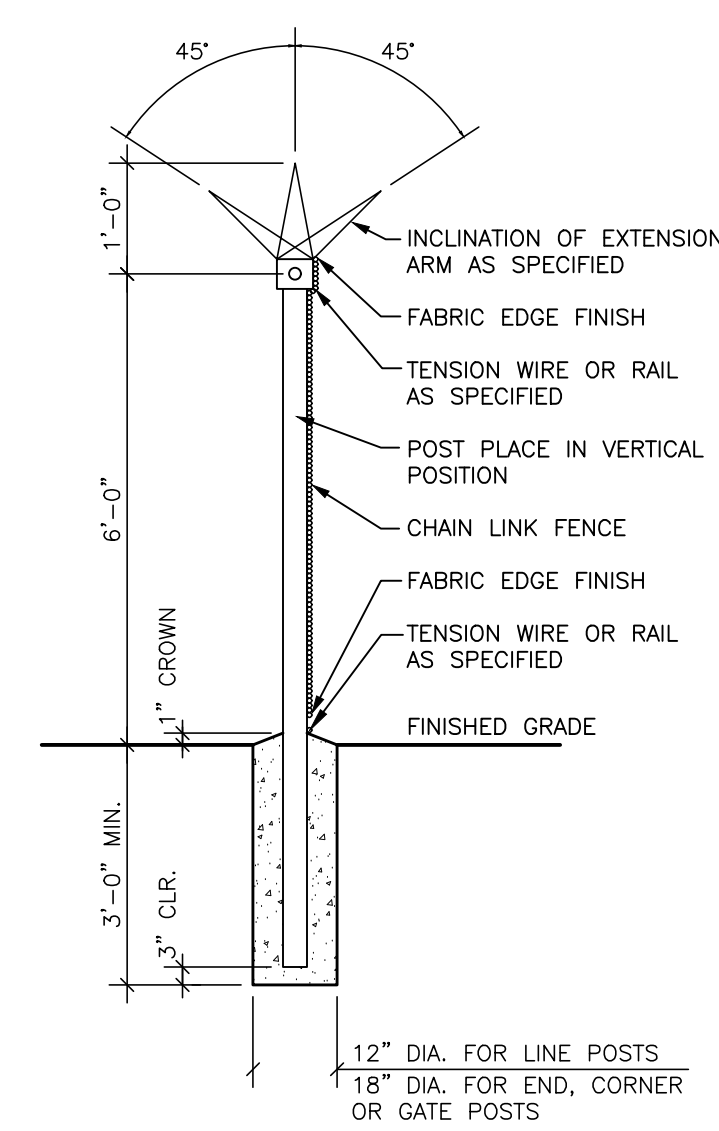
FENCE DETAIL - CHAIN LINK - STANDARD



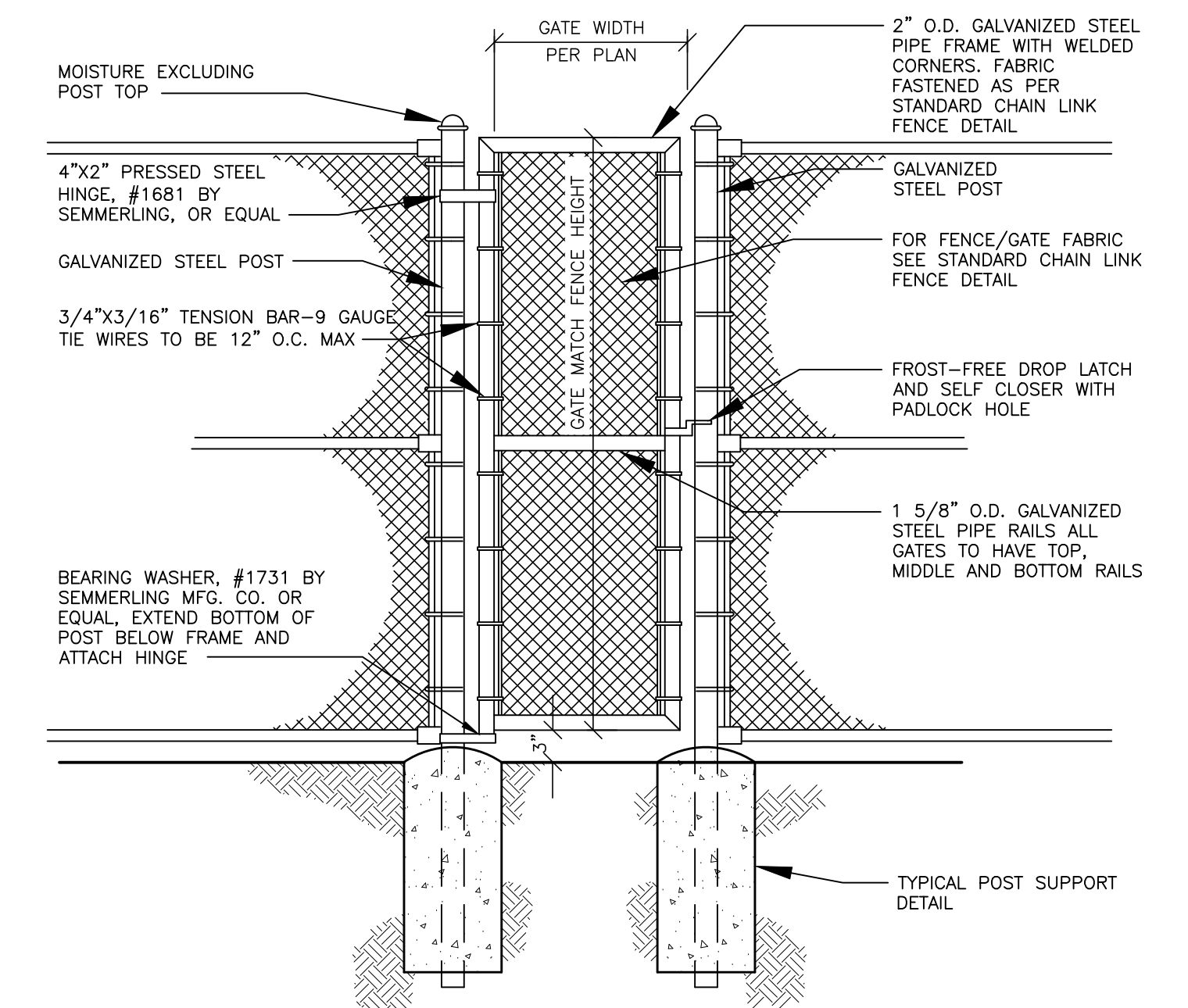
FENCE DETAIL - CHAIN LINK - ANGLED WITH BARBED WIRE



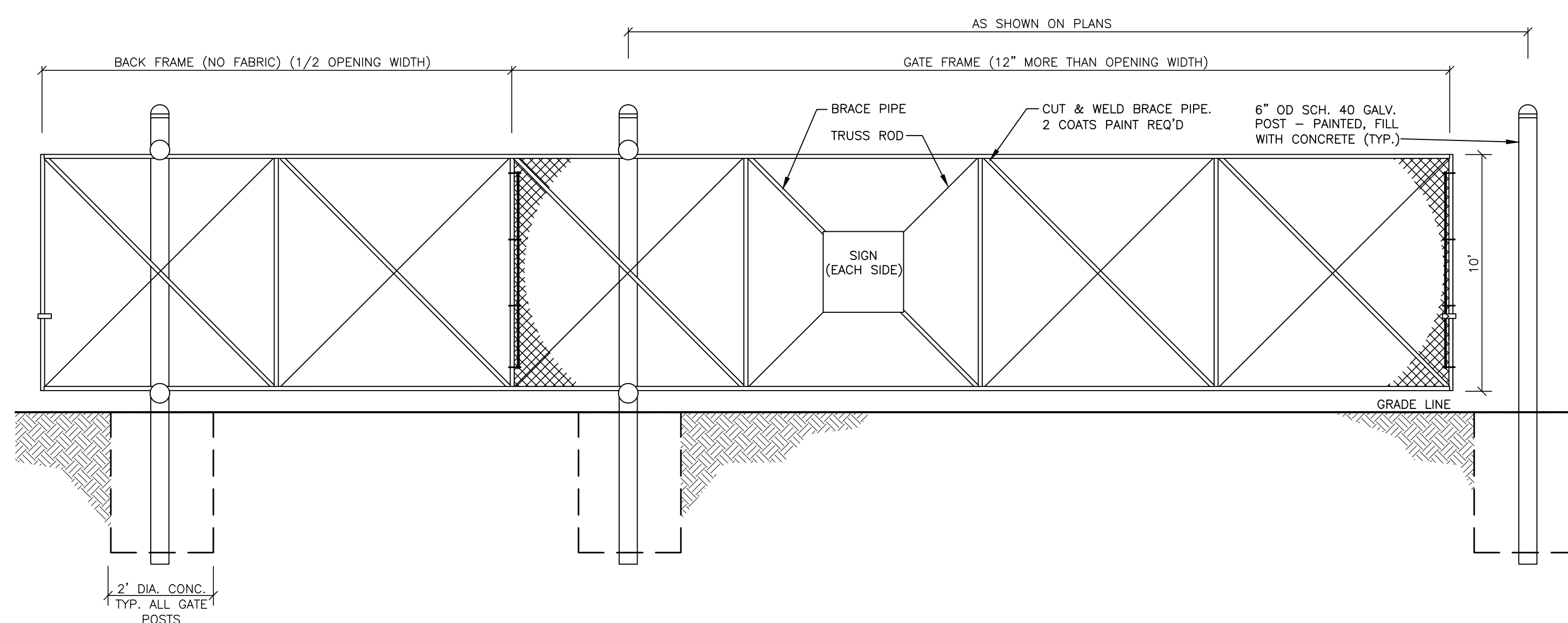
FENCE DETAIL - CHAIN LINK - POST SECTION



GATE DETAIL - CHAIN LINK - ACCESS - SINGLE SWING



GATE DETAIL - CANTILEVER - SINGLE - MANUAL



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PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th St. 48967
248.942.7866 / www.gtfca.com

FORBES
CONSULTANTS

PROJECT
WASHTEAW ARMORY - CONSTRUCTION
ADDITION

DESIGNED
DT
I. SCHEWITZ

DATE
04/01/2022

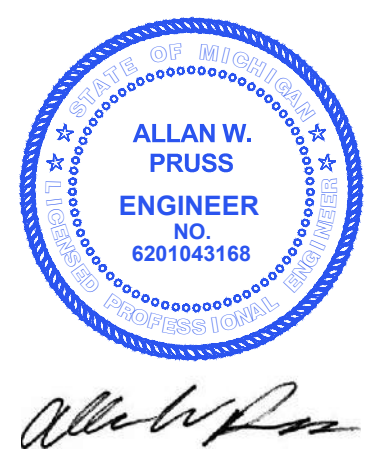
ISSUED FOR
CONSTRUCTION
DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTEAW ARMORY
CONTRACT NUMBER: 121456
FILE NO. 511/21326.CAK
DMA PROJECT NO. 263822016

SHEET NUMBER
18 OF 96

DRAWING TITLE
DETAILS

C-11.1



Allan W. Pruss

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE LOCAL MUNICIPALITY, THE LOCAL WATER AND/OR SEWER AUTHORITY, THE COUNTY D.P.W., THE COUNTY DRAIN COMMISSIONER, MICHIGAN DEPARTMENT OF TRANSPORTATION, MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES AND ENERGY, THE STATE OF MICHIGAN, AND THE COUNTY ROAD COMMISSION WHERE APPLICABLE.
- RULES, REGULATIONS OR LAWS OF ANY CONTROLLING GOVERNMENTAL AGENCY SHALL GOVERN, WHEN THEY ARE MORE STRINGENT THAN THE REQUIREMENTS OF THESE SPECIFICATIONS.
- SHOULD THE CONTRACTOR ENCOUNTER A CONFLICT BETWEEN THESE PLANS AND SPECIFICATIONS, EITHER AMONG THEMSELVES OR WITH THE REQUIREMENTS OF ANY AND ALL REVIEWING AND PERMIT-ISSUING AGENCIES, CONTRACTOR SHALL SEEK CLARIFICATION IN WRITING FROM THE ENGINEER BEFORE COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO SHALL BE AT SOLE EXPENSE TO THE CONTRACTOR.
- THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT TO COMPLETE THE TYPE OF WORK WHICH IS BID, IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, DETAILS AND TO THE SATISFACTION OF THE OWNER AND OWNER'S REPRESENTATIVE.
- CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.
- ANY WORK WITHIN STREET OR HIGHWAY RIGHT-OF-WAYS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE GOVERNMENTAL AGENCIES HAVING JURISDICTION AND SHALL NOT BEGIN UNTIL PERMITS HAVE BEEN ISSUED BY THESE GOVERNING AUTHORITIES.
- ALL NECESSARY PERMITS, BONDS, INSURANCES, ETC., SHALL BE PAID FOR BY THE CONTRACTOR.
- ALL ELEVATIONS SHOWN ARE BASED ON BENCHMARKS PROVIDED BY THE LOCAL MUNICIPALITY UNLESS OTHERWISE NOTED ON THE DRAWINGS.
- ALL ITEMS OF WORK NOT SPECIFICALLY INDICATED AS PAY ITEMS ON THE DRAWINGS OR IN THE BID PACKAGE SHALL BE CONSIDERED INCIDENTAL ITEMS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL DURING THE PERIODS OF CONSTRUCTION.
- AT LEAST THREE (3) WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL CONTACT MISS DIG (1-800-482-7171) TO VERIFY THE LOCATION OF ANY EXISTING UNDERGROUND UTILITIES AND SHALL NOTIFY REPRESENTATIVES OF OTHER UTILITIES IN THE VICINITY OF THE WORK.
- ALL PROPERTIES OR FACILITIES IN THE SURROUNDING AREAS, PUBLIC OR PRIVATE, DESTROYED OR OTHERWISE DISTURBED DUE TO CONSTRUCTION, SHALL BE REPLACED AND/OR RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE OWNER.
- MANHOLE, CATCH BASIN, GATE WELL, RIMS AND HYDRANT FINISH GRADE ELEVATIONS MUST BE AS-BUILT AND APPROVED BY THE ENGINEER BEFORE THE CONTRACTOR'S WORK IS CONSIDERED COMPLETE. AGENCY REQUIREMENTS FOR RECORD DRAWINGS ALSO APPLY.
- CONTRACTOR SHALL REMOVE AND DISPOSE OF OFF-SITE ANY TREES, BRUSH, STUMPS, TRASH OR OTHER UNWANTED DEBRIS, AT THE OWNER'S DIRECTION, INCLUDING OLD BUILDING FOUNDATIONS AND FLOORS, THE BURNING OR BURYING OF TRASH, STUMPS OR OTHER DEBRIS WILL NOT BE ALLOWED.
- ALL REFERENCES TO M.D.O.T. SPECIFICATIONS REFER TO THE MOST CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- ALL CONTRACTORS BIDDING THIS PROJECT SHALL HAVE VISITED THE SITE TO BECOME THOROUGHLY FAMILIAR WITH THE CONDITIONS IN WHICH THEY WILL BE CONDUCTING THEIR OPERATIONS, ANY VARIANCE FOUND BETWEEN THE PLANS AND EXISTING CONDITIONS SHALL BE REPORTED IMMEDIATELY TO THE DESIGN ENGINEER.
- THE LOCATIONS AND DIMENSIONS SHOWN ON THE PLANS FOR EXISTING UNDERGROUND FACILITIES ARE IN ACCORDANCE WITH AVAILABLE INFORMATION PROVIDED BY THE UTILITY COMPANIES AND GOVERNMENTAL AGENCIES WITHOUT UNCOVERING AND MEASURING. THE DESIGN ENGINEER DOES NOT GUARANTEE THE ACCURACY OF THIS INFORMATION OR THAT ALL EXISTING UNDERGROUND FACILITIES ARE SHOWN.
- THE OWNER MAY EMPLOY AND PAY FOR THE SERVICES OF AN ENGINEER TO PROVIDE ON-SITE INSPECTION AND VERIFY IN THE FIELD THAT ALL BACKFILL, PAVEMENTS AND CONCRETE CURB AND GUTTER HAVE BEEN PLACED AND COMPACTED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. IF, IN THE OPINION OF THE ENGINEER, THE WORK DOES NOT MEET THE TECHNICAL DESIGN REQUIREMENTS STIPULATED FOR THE WORK, THE CONTRACTOR SHALL MAKE ALL NECESSARY ADJUSTMENTS AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL MAKE NO DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT SPECIFIC WRITTEN APPROVAL OF THE OWNER.
- ALL EXCAVATED MATERIAL REMOVED FROM THE SANITARY SEWER, STORM SEWER AND WATER MAIN TRENCHES UNDER, THROUGH AND WITHIN 3 FEET OF THE 45' ZONE OF INFLUENCE LINE OF EXISTING OR PROPOSED PAVING, SIDEWALK AREAS AND PER PLANS, NOT SUITABLE FOR BACKFILL, SHALL BE REMOVED FROM THESE AREAS AND DISPOSED OF.
- THE CONTRACTOR SHALL RESTORE TO THEIR PRESENT CONDITIONS ANY PAVEMENT OR PUBLIC RIGHTS-OF-WAY THAT IS DISTURBED BY THE OPERATIONS OF THE CONTRACTOR. ALL RESTORATION WORK IN PUBLIC RIGHTS-OF-WAY SHALL BE PERFORMED TO THE SATISFACTION OF THE GOVERNMENT AGENCIES HAVING JURISDICTION.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE AND LIGHTS TO PROTECT THE WORK AND SAFELY MAINTAIN TRAFFIC, IN ACCORDANCE WITH LOCAL REQUIREMENTS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION).
- O.S.H.A. SAFETY REQUIREMENTS - ALL WORK, WORK PRACTICE, AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL SAFETY, OCCUPATIONAL, HEALTH AND ENVIRONMENTAL REGULATIONS AND ALSO NFPA AND ANSI CODES AS APPLICABLE. ALL WORK INSIDE A CONFINED SPACE SUCH AS MANHOLES OR UNDERGROUND STRUCTURES SHALL BE COORDINATED WITH UTILITY OWNER AND ALL WORKER SAFETY REQUIREMENTS STRICTLY ENFORCED. LAND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR OR SUPPLY TEMPORARY WATER SERVICE, SANITARY FACILITIES AND ELECTRICITY.
- CONTRACTOR SHALL PROVIDE FOR THE CONTINUOUS OPERATION OF EXISTING FACILITIES WITHOUT INTERRUPTION DURING CONSTRUCTION UNLESS SPECIFICALLY AUTHORIZED OTHERWISE BY THE RESPECTIVE AUTHORITY.
- THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES IN THE PROJECT PLANS. TRENCH BACKFILL FOR EXISTING UTILITIES SHALL BE EXAMINED CRITICALLY. ANY TRENCH WHICH, IN THE OPINION OF THE SOILS ENGINEER ARE FOUND TO BE SOFT, UNSTABLE, OR UNSUITABLE MATERIAL SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH SUITABLE MATERIAL. SAND BACKFILL SHALL BE USED UNDER PAVEMENT OR WITHIN 3 FEET OF THE 45' INFLUENCE LINE OF PAVEMENT OR STRUCTURES.

EROSION CONTROL STANDARDS

- ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO STANDARDS AND SPECIFICATIONS OF THE JURISDICTIONAL AGENCY UNDER PART 91 OF ACT 451 OF 1994, AS AMENDED.
- UNDER "MICHIGAN'S PERMIT-BY-RULE FOR CONSTRUCTION ACTIVITIES", PROMULGATED UNDER ACT 245, PUBLIC ACTS OF 1929 AS AMENDED, AN NPDES STORM WATER DISCHARGE COVERAGE PERMIT IS REQUIRED FOR ANY CONSTRUCTION ACTIVITY THAT DISTURBS 1 ACRE OR MORE OF LAND. A CERTIFIED STORM WATER OPERATOR IS REQUIRED FOR THE SUPERVISION AND INSPECTION OF THE SOIL EROSION CONTROL MEASURES AT THE CONSTRUCTION SITE IN ACCORDANCE WITH THE PROVISIONS OF THESE RULES.
- DAILY INSPECTIONS SHALL BE MADE BY CONTRACTOR WHILE WORKING TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY. ALL SOIL EROSION CONTROL PROVISIONS SHALL BE PROPERLY MAINTAINED DURING CONSTRUCTION.
- EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, AND PONDS.
- CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER EARTH CHANGE AREAS HAVE BEEN COMPLETED.

EROSION CONTROL STANDARDS CONTINUED

- STAGING THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH.
- SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
- DUST SHALL BE CONTROLLED BY WATERING OR BY OTHER APPROVED MEANS THROUGHOUT ALL CONSTRUCTION OPERATIONS.
- ALL WATER FROM DEWATERING OR SURFACE DRAINAGE FROM THE CONSTRUCTION SITE SHALL BE CONTROLLED TO ELIMINATE SEDIMENT CONTAMINATION OF OFF-SITE WATERWAYS OR STORM SEWERS. SUCH MEASURES SHALL BE APPROVED BY THE ENGINEER PRIOR TO ANY DEWATERING OR LAND DISTURBANCE.
- PERMANENT SOIL EROSION CONTROL MEASURES FOR SLOPES, CHANNELS, DITCHES OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED WITHIN 5 CALENDAR DAYS. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLIANCE IS ISSUED.

STORM SEWER SPECIFICATIONS

- THESE SPECIFICATIONS SHALL BE USED IN CONJUNCTION WITH THE GENERAL SPECIFICATIONS AND THE SPECIFICATIONS AND DETAIL SHEETS OF THE GOVERNING AGENCIES. IF ANY CONFLICT IS FOUND BETWEEN THE SPECIFICATIONS, THE STRICTER SPECIFICATIONS SHALL BE FOLLOWED.
- CONTRACTOR SHALL FURNISH CERTIFIED EVIDENCE THAT ALL MATERIAL TESTS AND INSPECTIONS HAVE BEEN PERFORMED AND THAT THE PRODUCT HAS BEEN MANUFACTURED IN COMPLIANCE WITH THE APPLICABLE SPECIFICATIONS.
- PROPER IMPLEMENTS, TOOLS AND FACILITIES SHALL BE PROVIDED AND USED FOR UNLOADING AND DISTRIBUTING MATERIALS ALONG THE LINE OF WORK. ANY PIPE OR FITTING DAMAGED IN TRANSPORTATION OR HANDLING SHALL BE REJECTED AND IMMEDIATELY REMOVED FROM THE JOB SITE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF ALL MATERIAL INTENDED FOR THE WORK. HE SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO MATERIALS, EQUIPMENT AND WORK.
- PIPE BEDDING, UNLESS OTHERWISE INDICATED, SHALL BE CL. II SAND, CRUSHED STONE OR ROUNDED GRAVEL. BEDDING MATERIAL SHALL HAVE 95% PASSING A 3/4" SIEVE AND AT LEAST 50% RETAINED ON A NO. 4 SIEVE.
- POROUS FILTER MATERIAL FOR PERFORATED SUBSURFACE DRAINS SHALL BE CRUSHED ROCK OR GRAVEL GRADED BETWEEN 1-1/2" AND 3/4" OR PER PLANS AND DETAILS.
- BACKFILL, UNLESS OTHERWISE NOTED, SHALL BE COARSE SAND, FINE GRAVEL OR EARTH HAVING A LOW PLASTICITY INDEX, FREE OF ROCKS, DEBRIS AND OTHER FOREIGN MATERIALS AND DEFINED AS ALL PASSING THROUGH A 3/8" SIEVE AND NOT MORE THAN 10% BY VOLUME PASSING THROUGH A 200-MESH SIEVE.
- STORM SEWER PIPING AND FITTINGS SHALL BE OF THE SIZE AND TYPE INDICATED ON THE DRAWINGS AND SHALL CONFORM TO THE FOLLOWING:
 - POLYVINYL CHLORIDE (PVC) AND ACRYLONITRILE BUTADIENE STYRENE (ABS) FOR PIPE UP TO AND INCLUDING 10" IN DIAMETER, SHALL CONFORM TO ASTM D3034, SDR 23.5 FOR PVC PIPE AND ASTM D2751 FOR ABS PIPE WITH ELASTOMETRIC GASKET JOINTS CONFORMING TO ASTM D3212 OR CHEMICALLY WELDED JOINTS CONFORMING TO ASTM F545.
 - REINFORCED CONCRETE PIPE, FOR PIPE 12" IN DIAMETER AND UP, SHALL CONFORM TO ASTM C-76, CLASS IV UNLESS MODIFIED BY THE DRAWINGS. JOINTS SHALL BE MODIFIED GROOVED TONGUE WITH RUBBER GASKET CONFORMING TO ASTM C-443.
 - PERFORATED SUBSURFACE DRAIN PIPE SHALL BE PVC CONFORMING TO ASTM D-2729 OR PERFORATED, CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONFORMING TO AASHTO M-294. JOINTS FOR PVC AND POLYETHYLENE PIPE SHALL BE PREFABRICATED COUPLING WITH SOLVENT WELD.
- MANHOLES, CATCH BASINS, AND INLETS SHALL BE OF THE SIZE AND TYPE INDICATED ON THE DRAWINGS AND SHALL BE CONSTRUCTED OF THE FOLLOWING:
 - REINFORCED PRE-CAST CONCRETE MANHOLE SECTIONS INCLUDING CONCENTRIC OR ECCENTRIC CONES AND GRADINGS SHALL BE 4000 PSI CONCRETE AND CONFORM TO ASTM C-478-64T.
 - BRICK SHALL BE SOUND, HARD-BURNED THROUGHOUT AND OF UNIFORM SIZE AND QUALITY AND SHALL BE IN ACCORDANCE WITH AASHTO M 91, GRADE MS.
 - CONCRETE MASONRY SHALL BE SOLID PRE-CAST SEGMENTAL UNITS CONFORMING TO ASTM C-139.
- IRON CASTINGS SHALL CONFORM TO ASTM A-48, CLASS 30. BEARING SURFACES BETWEEN CAST IRON FRAMES, COVERS AND GRATES SHALL BE MACHINED, FITTED TOGETHER AND MATCHED-MARKED TO PREVENT ROCKING. SYSTEM IDENTIFYING LETTERS 2" HIGH SHALL BE STAMPED OR CAST INTO ALL COVERS SO THAT THEY ARE PLAINLY VISIBLE. SEE MUNICIPALITY STANDARDS FOR ACTUAL WORKING.
- CASTINGS SHALL BE MANUFACTURED BY EAST JORDAN IRON WORKS, INC., NEENAH FOUNDRY COMPANY OR EQUAL.
- CONCRETE AND MASONRY MATERIALS FOR CONSTRUCTION OF STORM DRAINAGE STRUCTURES SHALL CONSIST OF THE FOLLOWING:
 - PORTLAND CEMENT SHALL BE STANDARD BRAND OF PORTLAND CEMENT CONFORMING TO ASTM C-150, TYPE I OR IA.
 - FINE AND COARSE AGGREGATES FOR CONCRETE SHALL BE PER ASTM C-33.
 - AGGREGATE FOR CEMENT MORTAR SHALL BE CLEAN, SHARP SAND CONFORMING TO ASTM C-144.
 - HYDRATED LIME SHALL COMPLY WITH ASTM C-207, TYPE S.
 - WATER SHALL MEET THE REQUIREMENTS OF MDOT SPEC SECTION 911.
 - REINFORCING STEEL FOR CONCRETE SHALL BE INTERMEDIATE-GRADE NEW BILLET STEEL CONFORMING TO ASTM A-615, GRADE 40.

- CONCRETE, UNLESS OTHERWISE NOTED, SHALL HAVE COMPRESSIVE STRENGTH AFTER 28 DAYS OF 3000 PSI MINIMUM WITH 3" MAXIMUM SLUMP.
 - CONCRETE FILL BELOW GRADE MAY BE 2500 PSI AT 28 DAYS.
 - CONCRETE, WHERE EXPOSED TO THE WEATHER, SHALL BE AIR-ENTRAINED. AIR ENTRAINMENT SHALL BE ACCOMPLISHED BY THE USE OF ADDITIVES CONFORMING TO ASTM C-260. AIR CONTENT SHALL BE 6% ± 1% ADDITIVE SHALL BE USED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S PRINTED DIRECTIONS.
 - READY-MIX CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-94.
- MORTAR SHALL BE SPECIFIED HEREINAFTER. USE METHOD OF MIXING MORTAR AT JOB SO THAT SPECIFIED PROPORTIONS OF MORTAR MATERIALS CAN BE CONTROLLED AND ACCURATELY MAINTAINED DURING WORK PROGRESS. MORTAR SHALL NOT BE MIXED IN GREATER QUANTITIES THAN REQUIRED FOR IMMEDIATE USE, WITH AMOUNT OF WATER CONSISTENT WITH SATISFACTORY WORKABILITY. RE-TAMPING OF MORTAR IS NOT PERMITTED.
 - MORTAR FOR LAYING BRICK OR CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C-270, TYPE M, AVERAGE COMPRESSIVE STRENGTH 2500 PSI MINIMUM AT 28 DAYS. MORTAR MIX SHALL BE PROPORTIONED BY VOLUME.
 - MORTAR FOR PLASTERING SHALL CONSIST OF 1 PART PORTLAND CEMENT AND 2-1/2 PARTS SAND.
 - MORTAR FOR GROUTING OF RIP-RAP SHALL CONSIST OF 1 PART PORTLAND CEMENT AND 3-1/2 PARTS SAND.
- PERFORM ALL EXCAVATING AND TRENCHING TO DIMENSIONS AND ELEVATIONS INDICATED ON DRAWINGS.

STORM SEWER SPECIFICATIONS, CONTINUED

- OPEN NO MORE TRENCH IN ADVANCE OF PIPE LAYING THAN IS NECESSARY TO EXPEDITE THE WORK.
- CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED ON DRAWINGS. WHERE EXCESSIVE OR UNAUTHORIZED EXCAVATION TAKES PLACE, THE OVERDEPTH SHALL BE BACKFILLED TO THE PROPER GRADE WITH COMPACTED BEDDING MATERIAL, AT NO EXPENSE TO THE OWNER.
- WHERE UNSTABLE SOIL IS ENCOUNTERED, CONTRACTOR SHALL NOT PLACE PIPE UNTIL A SOLID BED HAS BEEN PROVIDED.
- EXCAVATION FOR DRAINAGE STRUCTURES SHALL EXCEED A SUFFICIENT DISTANCE FROM THE WALLS AND FOOTINGS TO ALLOW FOR FORMS, CONSTRUCTION OF WALLS, CONNECTIONS AND FOR INSPECTION.
- PROVIDE REQUIRED TIMBER SHEETING, BRACING AND SHORING TO PROTECT SIDES OF EXCAVATION. DO NOT BRACE SHEETING AGAINST PIPE. PROVIDE SUITABLE LADDERS FOR SAFE ENTRY TO AND EXIT FROM EXCAVATION.
- DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE PILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF TRENCHES TO AVOID OVERLOADING, AND TO PREVENT SLIDES OR CAVE-INS.
- WHEN MET EXCAVATION IS ENCOUNTERED, THE TRENCH SHALL BE DE-WATERED UNTIL THE PIPE HAS BEEN LAID AND BACKFILLED TO A POINT AT LEAST 1 FOOT ABOVE TOP OF PIPE.
- MANHOLES AND CATCH BASINS SHALL BE CONSTRUCTED OF BRICK, CONCRETE MASONRY UNITS OR PRE-CAST CONCRETE WITH CAST IRON FRAMES, COVERS AND MANHOLE STEPS.
- THE WALL THICKNESS OF MANHOLES AND CATCH BASINS CONSTRUCTED OF VARIOUS MATERIALS AND SET AT VARIOUS DEPTHS SHALL MEET THESE MINIMUMS. ADHERE TO REQUIREMENTS OF THE GOVERNING AGENCY IF THEY EXCEED THESE THICKNESSES:

DEPTH	BRICK	CONCRETE BLOCK	PRE-CAST CONCRETE
0' - 10'	8"	6"	6"
10' - 16'	12"	8"	8"
16' - 25'	16"	12"	12"
- WHENEVER EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, DRILL HOLES 4" CENTER, TO CENTER, AROUND THE PERIPHERY OF OPENINGS TO CREATE A PLANE OF WEAKNESS JOINT BEFORE BREAKING SECTION OUT.
- MANHOLE STEPS SHALL BE BUILT INTO AND THOROUGHLY ANCHORED TO WALLS. STEPS SHALL BE FACTORY INSTALLED IN PRE-CAST STRUCTURES.
- ALL PIPING ENTERING OR LEAVING DRAINAGE STRUCTURES SHALL BE ADEQUATELY SUPPORTED BY POURED IN-PLACE CONCRETE FILL FROM PIPE CENTER TO UNDISTURBED GROUND.
- SET FRAMES IN FULL BED OF STIFF MORTAR OR BITUMINOUS MASTIC JOINTING COMPOUND AT FINAL ELEVATION.
- ALL TIMBER SHEETING BELOW A PLANE 12" ABOVE TOP OF PIPE SHALL REMAIN IN PLACE IN ORDER NOT TO DISTURB PIPE GRADING. BEFORE BACKFILLING, REMOVE ALL OTHER SHEETING BRACING AND SHORING.
- BEDDING USED FOR TRENCH BOTTOM SHALL BE EXTENDED UP THE SIDES AND CAREFULLY PLACED AROUND AND OVER PIPE IN 6" MAXIMUM LAYERS. EACH LAYER SHALL BE THOROUGHLY AND CAREFULLY COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS PER ASTM D-1557 (MODIFIED PROCTOR) UNTIL 12" OF COVER EXISTS OVER PIPE.
- REMAINDER OF TRENCH SHALL BE BACKFILLED WITH SPECIFIED BACKFILL MATERIAL TO SPECIFIED SUBGRADE ELEVATION. BACKFILLING SHALL BE COMPACTED TO 90% OF MAXIMUM DRY DENSITY PER ASTM D-1557.
- WITHIN 3' OF THE 45' INFLUENCE LINE OF THE SUBGRADE OF STREETS, DRIVES, PARKING LOTS AND OTHER AREAS TO HAVE OR HAVING IMPROVED HARD SURFACES, BACKFILL SHALL BE COMPACTED AND SHALL BE DEPOSITED IN 6" LAYER LAYERS AT OPTIMUM MOISTURE CONTENT (±2%) COMPACTED TO 95% OF MAXIMUM DRY DENSITY PER ASTM D1557. (MODIFIED PROCTOR) SUITABLE MATERIALS FOUND ON SITE MAY BE USED.
- BEFORE BACKFILLING AROUND DRAINAGE STRUCTURES, ALL FORMS, TRASH AND DEBRIS SHALL BE REMOVED AND CLEARED AWAY. SELECTED EXCAVATED MATERIAL SHALL BE PLACED SYMMETRICALLY ON ALL SIDES IN 6" MAXIMUM LAYERS. EACH LAYER SHALL BE MOISTENED AND COMPACTED WITH MECHANICAL OR HAND TAMPERS.
- AFTER INSTALLATION OF PIPES AND DRAINAGE STRUCTURES, CLEAN THEM, AND ADJUST TOPS TO FINISH GRADE. PIPE SHALL BE STRAIGHT BETWEEN STRUCTURES, WITH THE FULL INSIDE DIAMETER VISIBLE WHEN SIGHTING BETWEEN STRUCTURES.
- ENDS OF HEADWALL AND END SECTIONS FOR PIPES LARGER THAN 6 INCHES, SHALL BE FITTED WITH A #4 ROUND MINIMUM WELDED STEEL ROD GRATING. RODS SHALL BE SPACED 6" O.C. MAXIMUM. WELD ROD AT ALL INTERSECTIONS. GRATE SHALL BE REMOVABLE FOR ACCESS AND CLEANING.
- RIP-RAP SHALL BE LAID FROM THE BOTTOM UPWARD; STONES SHALL BE LAID BY HAND WITH 8" MINIMUM DIMENSION PERPENDICULAR TO GRADE WITH WELL-BROKEN JOINTS, COMPACTED AS IT GOES, TRUE TO LINE. ALL JOINTS SHALL BE FILLED WITH CEMENT MORTAR. SURFACE STONE TO BE EXPOSED. CLEAN JOINTS WITH WIRE BRUSH.
- THE CONTRACTOR SHALL DO ALL REQUIRED EXCAVATION AND TRENCHING WORK AND THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE COMPLETION OF THE WORK HEREIN REGARDLESS OF THE NATURE OF MATERIALS ENCOUNTERED DURING THE COURSE OF THE WORK. THE OWNER WILL NOT BE LIABLE FOR ANY COSTS WHATSOEVER ASSOCIATED WITH, BUT NOT LIMITED TO, THE PRESENCE OF ROCK, PEAT, SUBTERRANEAN STREAMS, EXCESSIVE WATER OR OTHER DIFFICULT OR UNANTICIPATED SUB-SURFACE PHENOMENA.
- ALL CONNECTIONS TO EXISTING SEWERS SHALL BE PER MUNICIPAL REQUIREMENTS, AND ALL COSTS INCLUDING TESTING AND/OR VIDEO OF SEWERS SHALL BE INCIDENTAL TO THE JOB.

WATER MAIN SPECIFICATIONS

- WATER MAIN SPECIFICATIONS SHALL BE USED IN CONJUNCTION WITH THE GENERAL SPECIFICATIONS, THE WATERMAIN SPECIFICATIONS, AND THE DETAIL SHEETS OF THE GOVERNING AGENCIES. IF ANY CONFLICT IS FOUND BETWEEN THE SPECIFICATIONS, THE STRICTER SPECIFICATIONS SHALL BE FOLLOWED.
- DUCTILE IRON PIPE, 16" DIAMETER AND SMALLER, SHALL CONFORM TO ANSI/AWWA SPECIFICATION C151/A21.51, CLASS 54. DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI/AWWA SPECIFICATION C110/A21.10 FOR STANDARD FITTINGS OR TO ANSI/AWWA SPECIFICATION C153/A21.53 FOR COMPACT FITTINGS. DUCTILE IRON PIPE AND FITTINGS SHALL HAVE A DOUBLE THICKNESS CEMENT MORTAR LINING CONFORMING TO ANSI SPECIFICATION A21.4.
- JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE U.S. PIPE AND FOUNDRY COMPANY "TYTON JOINT" OR APPROVED EQUAL.
- ALL WATER MAIN SHALL BE INSTALLED WITH A MINIMUM COVER OF FIVE FEET, OR AS SPECIFIED BY THE LOCAL GOVERNING MUNICIPALITY, BELOW FINISH GRADE UNLESS OTHERWISE NOTED IN THE PLANS. WHEN WATER MAINS MUST DIP TO PASS UNDER A STORM SEWER OR SANITARY SEWER, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE KEPT TO A MINIMUM LENGTH BY THE USE OF VERTICAL 11-1/4 BENDS PROPERLY ANCHORED.
- SEE THE WATER MAIN STANDARD DETAIL SHEETS OF THE GOVERNING AGENCY FOR THE SPECIFIC TYPE OF HYDRANTS AND VALVES TO BE USED FOR THIS PROJECT. THESE DETAIL SHEETS ARE INCLUDED AS PART OF THE PLANS.
- BEFORE ANY WATER MAIN WILL BE ACCEPTED BY THE GOVERNING AGENCY, IT MUST PASS A PRESSURE TEST COMPLYING WITH THE CURRENT SPECIFICATIONS AND PROCEDURES OF THE AGENCY.
- BEFORE ANY WATER MAIN SYSTEM WILL BE ACCEPTED BY THE GOVERNING AGENCY, THE FIRE HYDRANTS MUST BE PAINTED AS INDICATED ON THE WATER MAIN STANDARD DETAIL SHEETS.
- TWO INCH (2") DIAMETER CORPORATION STOPS SHALL BE PROVIDED IN BOTH THE EXISTING WATER MAIN AND THE NEW WATER MAIN AT ALL NEW CONNECTIONS.
- ALL TEES, BENDS CONNECTIONS, ETC. ARE INCIDENTAL TO THE JOB.
- PHYSICAL CONNECTIONS SHALL NOT BE MADE BETWEEN EXISTING AND NEW WATERMANS UNTIL TESTING IS SATISFACTORILY COMPLETED.



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 TECHNICAL CONSULTANTS

PROJECT: WASHTEANAW ARMORY - CONSTRUCTION ADDITION

DESIGNED: DT
 DRAWN: I. SCHEWITZ
 CHECKED: I. SCHEWITZ
 APPROVED: I. SCHEWITZ

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GRADING AND EARTHWORK SPECIFICATIONS

- ALTHOUGH A SUB-SURFACE INVESTIGATION MAY HAVE BEEN MADE BY THE OWNER, THE BIDDER AND ANY SUB-CONTRACTORS SHALL MAKE A PERSONAL INVESTIGATION OF SITE AND EXISTING SURFACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE TO ACQUAINT HIMSELF WITH CONDITIONS OF THE WORK AREA. THE CONTRACTOR IS ADVISED TO DETERMINE THE SUB-SURFACE SOIL CONDITIONS AND GROUND WATER CONDITIONS TO HIS OWN SATISFACTION PRIOR TO BIDDING. NO MODIFICATIONS TO THE UNIT PRICES BID FOR ANY ITEM WILL BE MADE DUE TO VARIABLE SUB-SURFACE CONDITIONS. Dewatering, if determined necessary by the contractor, by well pointing or deep wells will be incidental to the installation cost of the item.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING DETERMINED TO HIS SATISFACTION PRIOR TO THE SUBMISSION OF HIS BID THE CONFIRMATION OF THE GROUND, THE CHARACTER AND QUALITY OF THE SUBSTRATA, THE TYPES AND QUANTITIES OF MATERIALS TO BE ENCOUNTERED, THE NATURE OF THE GROUNDWATER CONDITIONS, THE PROSECUTION OF THE WORK, THE GENERAL AND LOCAL CONDITIONS INCLUDING RECENT CLIMATIC CHANGES, THE TIME OF YEAR IN WHICH CONSTRUCTION WILL TAKE PLACE AND ALL OTHER MATTERS WHICH CAN IN ANY WAY AFFECT THE WORK UNDER THIS CONTRACT.
- PRIOR TO COMMENCING THE EXCAVATION THE CONTRACTOR SHALL SUBMIT A PLAN OF HIS PROPOSED OPERATIONS AND TIME SCHEDULE TO THE OWNER & OWNERS REPRESENTATIVE FOR THEIR APPROVAL.
- THE CONTRACTOR SHALL CONSIDER, AND HIS PLAN FOR EXCAVATION SHALL REFLECT, THE EQUIPMENT AND METHODS TO BE EMPLOYED IN THE EXCAVATION AND WHAT METHODS WILL BE USED WHEN WET CONDITIONS ARE ENCOUNTERED REQUIRING GROUNDWATER CONTROL. OTHER THAN THE METHODS SPECIFIED, THE CONTRACTOR SHALL SUBMIT AN OUTLINE OF HIS EARTHWORK METHODS WHICH SHALL TAKE INTO ACCOUNT THE OVERALL CONSTRUCTION SCHEDULE. THE PRICES ESTABLISHED IN THE PROPOSAL TO BE DONE SHALL REFLECT ALL COSTS PERTAINING TO THE WORK, NO CLAIMS FOR EXTRAS BASED ON SUBSTRATA OR GROUNDWATER TABLE CONDITIONS OR MOISTURE CONDITIONING WILL BE ALLOWED.
- THE CONTRACTOR SHALL KEEP INFORMED AND THE OWNER'S REPRESENTATIVE INFORMED AT ALL TIMES AS TO A "FILL SURPLUS OR SHORTAGE" SITUATION. SHORTAGE OR SURPLUS OF SUITABLE MATERIAL AT THE CONCLUSION OF THE GRADING AND EARTHWORK OPERATION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND HE WILL BE REQUIRED TO SUPPLY THE DEFICIENCY OR DISPOSE OF THE SURPLUS WITHOUT ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL REMOVE VEGETATION, DEBRIS, UNSATISFACTORY SOIL MATERIALS, AND OTHER DELTERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO CUT OR FILL OPERATIONS. SUCH MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR TO BE DISPOSED OF IN A LEGAL MANNER OFF SITE.
- MATERIALS FOR FILL OR BACKFILL REQUIRED TO GRADE THE SITE AND ACHIEVE DESIGN ELEVATIONS SHALL BE EITHER ON OR OFF-SITE SOILS WHICH ARE FREE OF ORGANIC MATTER AND DEBRIS. NO TOPSOIL SHALL BE USED AS ENGINEERED FILL.
- NO FILL MAY BE PLACED UNTIL THE EXPOSED SURFACES HAVE BEEN APPROVED BY THE GEOTECHNICAL ENGINEER. ALL FILL MATERIALS SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.
- IF ANY UNKNOWN SUBSURFACE STRUCTURES ARE ENCOUNTERED DURING CONSTRUCTION, THEY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND DESIGN ENGINEER PRIOR TO PROCEEDING.
- ALL FILL MATERIAL SHALL BE PLACED AND COMPACTED AT THE OPTIMUM MOISTURE CONTENT OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- NO FROZEN MATERIAL SHALL BE USED AS FILL NOR WILL ANY FILL BE PLACED ON A FROZEN BASE.
- NO ROCK OR SIMILAR MATERIAL GREATER THAN 6" DIAMETER SHALL BE PLACED IN THE FILL UNLESS RECOMMENDATIONS FOR SUCH PLACEMENT HAVE BEEN SUBMITTED BY THE GEOTECHNICAL ENGINEER IN ADVANCE AND APPROVED BY THE OWNER AND OWNER'S REPRESENTATIVE.
- COMPACT FILL MATERIAL TO AT LEAST THE FOLLOWING PERCENTAGE OF MAXIMUM DRY DENSITY, AS DETERMINED BY ASTM D 1557 (MODIFIED PROCTOR).

FILL AREAS	% OF MAXIMUM DRY DENSITY
FILL UNDER BUILDINGS (EXTENDING 5' BEYOND FOOTING AT A SLOPE OF 1 ON 1)	98%
FILL UNDER PAVEMENT OR SIDEWALKS	95%
FILL PLACED UNDER OR BEHIND RETAINING WALLS	95%
ALL OTHER FILL	90%

BITUMINOUS PAVING SPECIFICATIONS

- REFERENCE SPECIFICATIONS WHERE APPLICABLE TO WORK UNDER THIS SECTION ARE REFERRED TO BY ABBREVIATION AS FOLLOWS:
 - AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).
 - THE ASPHALT INSTITUTE (TAI)
 - MICHIGAN DEPARTMENT OF TRANSPORTATION/ CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION (MDOT)
 - AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)
- AGGREGATE BASE COURSE SHALL MEET THE REQUIREMENTS OF SECTION 902 OF THE MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND SHALL CONSIST OF 21AA CRUSHED AGGREGATE. THE USE OF SLAG IS PROHIBITED.
- TACK COAT SHALL BE EMULSIFIED ASPHALT MEETING REQUIREMENTS OF MDOT SECTION 904, GRADE CSS-1H.
- AGGREGATE SHALL CONSIST OF CRUSHED STONE, CRUSHED GRAVEL, A MIXTURE OF UNCRUSHED GRAVEL WITH EITHER CRUSHED STONE OR CRUSHED GRAVEL, OR OTHER INERT MATERIAL HAVING SIMILAR CHARACTERISTICS. IT SHALL BE COMPOSED OF CLEAN, TOUGH, DURABLE FRAGMENTS FROM AN EXCESS OF FLAT OR ELONGATED PIECES. IT SHALL BE FREE OF ORGANIC MATTER AND DELTERIOUS SUBSTANCES AND MEET THE REQUIREMENTS OF MDOT STANDARD SPECIFICATIONS, SECTION 902, 21AA. CONTRACTOR MAY USE CRUSHED HMA AGGREGATE SCREENED TO MEET THE REQUIREMENTS OF MDOT 21AA MATERIAL.
- FINE AGGREGATE SHALL BE WELL GRADED FROM COARSE TO FINE AND CONSIST OF NATURAL SAND, STONE SCREENINGS, OR CRUSHED GRANITE AND STONE SCREENINGS. IT SHALL BE COMPOSED OF ROUGH SURFACED AND ANGULAR GRAINS OF QUARTZ OR OTHER HARD DURABLE ROCK AND MEET THE REQUIREMENTS OF MDOT STANDARD SPECIFICATIONS, SECTION 902 FOR CLASS II OR CLASS III GRANULAR MATERIAL. CONTRACTOR MAY USE CRUSHED HMA AGGREGATE SCREENED TO MEET THE REQUIREMENTS OF MDOT CLASS II OR CLASS III MATERIAL.
- ASPHALT CEMENT SHALL COMPLY WITH THE REQUIREMENTS OF MDOT SECTION 904.
- HOT MIXED ASPHALT (HMA) SHALL COMPLY WITH MDOT SECTION 501 OF STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- BITUMINOUS LEVELING COURSE SHALL BE MDOT HMA, 13A, UNLESS OTHERWISE REQUIRED BY THE MUNICIPALITY OR ROAD AGENCY WITH JURISDICTION.
- BITUMINOUS WEARING COURSE SHALL BE MDOT HMA, 36A UNLESS OTHERWISE REQUIRED BY THE MUNICIPALITY OR ROAD AGENCY WITH JURISDICTION. CONTRACTOR MAY SUBSTITUTE 13A WITH THE APPROVAL OF THE OWNER AND ENGINEER.
- THE CONTRACTOR SHALL SUBMIT, TO THE OWNER, TWO COPIES OF MATERIALS CERTIFICATES SIGNED BY MATERIAL PRODUCER AND CONTRACTOR. CERTIFICATES SHALL STATE THAT EACH MATERIAL ITEM MEETS SPECIFIED REQUIREMENTS.
- THE CONTRACTOR SHALL SUBMIT TO THE GEOTECHNICAL ENGINEER, JOB-MIX FORMULAS FOR EACH REQUIRED ASPHALT AGGREGATE MIXTURE. MIX DESIGNS SHALL BE WITHIN ALLOWABLE TOLERANCES AS SPECIFIED BY MDOT FOR THE PARTICULAR APPLICATION.
- SUBGRADE PREPARATIONS SHALL CONSIST OF THE FINAL MACHING OF THE SUBGRADE IMMEDIATELY PRIOR TO PLACING THE BITUMINOUS BASE COURSE. THE SUBGRADE SHALL BE COMPACTED PER PLANS AND DETAILS. THE SUBGRADE SHALL BE TRUE TO LINE AND GRADE.
- CRUSHED AGGREGATE BASE COURSE SHALL BE COMPACTED TO A DENSITY EQUAL TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 (MODIFIED PROCTOR).
- BITUMINOUS CONCRETE PAVEMENT CONSTRUCTION METHODS SHALL CONFORM TO APPLICABLE PORTIONS OF SECTION 501 OF THE MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- THE CONTRACTOR SHALL NOT PLACE THE AGGREGATE BASE COURSE OR THE BITUMINOUS WEARING COURSE PRIOR TO THE APPROVAL OF THE SUBGRADE BY THE GEOTECHNICAL ENGINEER.
- EACH LIFT AND COURSE OF BITUMINOUS CONCRETE SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER, PRIOR TO THE PLACEMENT OF A SUCCEEDING COURSE OR LIFT.
- APPLY BITUMINOUS TACK COATS ONLY WHEN TEMPERATURE HAS NOT BEEN BELOW 35 DEGREES F. FOR 12 HOURS IMMEDIATELY PRIOR TO APPLICATION. CONSTRUCT BITUMINOUS CONCRETE WEARING COURSE ONLY WHEN ATMOSPHERIC TEMPERATURE IS ABOVE 40-DEGREES F AND RISING, AND PROCEEDING COURSE OR LIFT IS CLEAN AND DRY. BASE COURSE MAY BE LAID WHEN TEMPERATURE IS ABOVE 35 DEGREES F. AND RISING AND APPROVED BY THE GEOTECHNICAL ENGINEER.
- THE BITUMINOUS CONCRETE SHALL BE TRANSPORTED FROM THE MIXING PLANT TO THE POINT OF USE IN VEHICLES CONFORMING TO THE REQUIREMENTS OF SECTION 501 OF THE MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION. DELIVERIES SHALL BE SCHEDULED SO THAT SPREADING AND ROLLING OF ALL BITUMINOUS CONCRETE PREPARED FOR ONE DAY'S RUN CAN BE COMPLETED DURING DAYLIGHT, UNLESS ADEQUATE ARTIFICIAL LIGHTING IS PROVIDED. HAULING OVER FRESHLY PLACED BITUMINOUS MAT SHALL NOT BE PERMITTED UNTIL THE BITUMINOUS CONCRETE HAS BEEN COMPACTED, AS SPECIFIED, AND ALLOWED TO COOL TO ATMOSPHERIC TEMPERATURE.
- UPON ARRIVAL, THE BITUMINOUS CONCRETE SHALL BE SPREAD TO A THICKNESS NOT TO EXCEED 3-INCHES AND TO THE FULL WIDTH BY AN APPROVED BITUMINOUS PAYER. IT SHALL BE STRUCK OFF IN A UNIFORM LAYER OF SUCH DEPTH THAT, WHEN THE WORK IS COMPLETED, IT SHALL HAVE THE REQUIRED THICKNESS AND CONFORM TO THE GRADE AND TO THE REQUIREMENTS OF THE SPEED OF THE PAYER SHALL BE REGULATED TO ELIMINATE PULLING AND TEARING OF THE BITUMINOUS MAT. UNLESS OTHERWISE DIRECTED, PLACEMENT OF THE BITUMINOUS CONCRETE SHALL BEGON ALONG THE CENTERLINE OF A CROWNED SECTION OR ON THE HIGH SIDE OF AREAS WITH A ONE-WAY SLOPE. THE BITUMINOUS CONCRETE SHALL BE PLACED IN CONSECUTIVE ADJACENT STRIPS HAVING A MINIMUM WIDTH OF 10 FEET, EXCEPT WHERE EDGE LANES REQUIRE LESS WIDTH TO COMPLETE THE AREA. TRANSVERSE JOINTS IN ADJACENT LANES SHALL BE OFFSET A MINIMUM OF 10 FEET. WHERE POSSIBLE, JOINTS SHALL BE LOCATED AT THE LANE EDGES.
- ON AREAS WHERE IRREGULARITIES OR UNAVOIDABLE OBSTACLES MAKE THE USE OF MECHANICAL SPREADING AND FINISHING EQUIPMENT IMPRACTICAL, THE BITUMINOUS CONCRETE MAY BE SPREAD AND RAKED BY HAND TOOLS.
- THE BITUMINOUS CONCRETE SHALL BE PLACED AT A TEMPERATURE OF NOT LESS THAN 250 NOR HIGHER THEN THE RECOMMENDED TEMPERATURE OF THE BINDER PRODUCER OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- THE BITUMINOUS CONCRETE MIXTURE SHALL BE THOROUGHLY AND UNIFORMLY COMPACTED BY ROLLING. THE SURFACE SHALL BE ROLLED WHEN THE BITUMINOUS MAT HAS ATTAINED SUFFICIENT STABILITY SO THAT THE ROLLING DOES NOT CAUSE UNDESIRABLE DISPLACEMENT, CRACKING AND SHOVING. THE SEQUENCE OF ROLLING OPERATIONS SHALL BE AT THE DISCRETION OF THE CONTRACTOR.
- THE SPEED OF THE ROLLER SHALL, AT ALL TIMES, BE SUFFICIENTLY SLOW TO AVOID DISPLACEMENT OF THE HOT BITUMINOUS CONCRETE. ANY DISPLACEMENT OCCURRING AS A RESULT OF REVERSING THE DIRECTION OF THE ROLLER, OR FROM ANY OTHER CAUSE, SHALL BE CORRECTED AT ONCE.
- SUFFICIENT ROLLERS SHALL BE FURNISHED TO HANDLE THE OUTPUT OF THE PLANT. ROLLING OF THE MIXING WATER TO THE CEMENT AND TO THE CEMENT AND AGGREGATES OR THE INTRODUCTION OF THE CEMENT TO THE AGGREGATES.
- IN HOT WEATHER (AIR TEMPERATURE 80-DEGREES F. AND ABOVE) OR UNDER CONDITIONS CONTRIBUTING TO QUICK STIFFENING OF THE CONCRETE, THE TIME SHALL BE REDUCED TO ONE HOUR.
- CONCRETE DELIVERED IN COLD WEATHER (AIR TEMPERATURE 45-DEGREES F. AND LOWER) SHALL HAVE A TEMPERATURE NOT LESS THAN 60-DEGREES F. AT THE POINT OF DISCHARGE AT THE JOB, AND IN COMPLIANCE WITH ACI 306R "COLD WEATHER CONCRETING", CONCRETE PLACING WILL NOT BE PERMITTED WHEN THE AIR TEMPERATURE IS 35-DEGREES F. OR LOWER.
- CONCRETE DELIVERED UNDER HOT WEATHER CONDITIONS CONTRIBUTING TO QUICK STIFFENING OF THE CONCRETE, OR IN AIR TEMPERATURE OF 90-DEGREES F. AND OVER, SHALL HAVE A TEMPERATURE BETWEEN 60- AND 80-DEGREES F. AT THE POINT OF DISCHARGE AT THE JOB, AND IN ACCORDANCE WITH ACI 305R "HOT WEATHER CONCRETING."
- IN AREAS NOT ACCESSIBLE TO THE ROLLER, THE BITUMINOUS CONCRETE SHALL BE THOROUGHLY COMPACTED WITH HOT HAND TAMPERS.
- ANY BITUMINOUS CONCRETE THAT BECOMES LOOSE AND BROKEN, MIXED WITH DIRT, OR IN ANY WAY DEFECTIVE SHALL BE REMOVED AND REPLACED WITH FRESH HOT BITUMINOUS CONCRETE AND IMMEDIATELY COMPACTED TO CONFORM TO THE SURROUNDING AREA. THIS WORK SHALL BE DONE AT THE CONTRACTOR'S EXPENSE. SKIN PATCHING SHALL NOT BE ALLOWED.
- THE CONTRACTOR SHALL PROVIDE AT LEAST TWO ROLLERS FOR EACH PAYER OPERATING ON THE WORK. THE CONTRACTOR SHALL USE ADDITIONAL ROLLERS AS REQUIRED TO OBTAIN THE SPECIFIED PAVEMENT DENSITY.

BITUMINOUS PAVING SPECIFICATIONS, CONTINUED

- THE CONTRACTOR SHALL CAREFULLY MAKE JOINTS BETWEEN OLD AND NEW PAVEMENTS OR PERSONAL SUCCESSIVE DAYS' WORK, TO ENSURE A CONTINUOUS BOND BETWEEN ADJOINING WORK. CONSTRUCT JOINTS TO HAVE THE SAME TEXTURE, DENSITY AND SMOOTHNESS AS OTHER SECTIONS OF THE BITUMINOUS CONCRETE COURSE. THE CONTRACTOR SHALL CLEAN CONTACT SURFACES OF SAND, DIRT, OR OTHER OBJECTIONABLE MATERIAL AND APPLY TACK COAT BEFORE MAKING THE JOINT.
- THE CONTRACTOR SHALL TEST THE FINISHED SURFACE OF EACH BITUMINOUS CONCRETE COURSE FOR SMOOTHNESS, USING A 10 FOOT STRAIGHTEDGE APPLIED PARALLEL WITH AND AT RIGHT ANGLES TO CENTERLINE OF PAVED AREA. SURFACE SHALL NOT BE ACCEPTABLE IF EXCEEDING THE FOLLOWING TOLERANCES FOR SMOOTHNESS.
 - LEVELING COURSE SURFACE: 1/4 INCH, PLUS OR MINUS 1/4 INCH.
 - SURFACE COURSE: 1/4 INCH
- THE CONTRACTOR SHALL TEST CROWNED SURFACES WITH A CROWN TEMPLATE, CENTERED AND AT RIGHT ANGLES TO THE CROWN. SURFACES WILL NOT BE ACCEPTABLE IF THE FINISHED CROWN SURFACES VARY MORE THAN 1/4 INCH FROM THE CROWN TEMPLATE.
- AFTER FINAL ROLLING, THE CONTRACTOR SHALL NOT PERMIT VEHICULAR TRAFFIC ON THE BITUMINOUS CONCRETE PAVEMENT UNTIL IT HAS COOLED AND HARDENED, AND IN NO CASE SOONER THAN SIX HOURS OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- THE AGGREGATE BASE MUST EXTEND A MINIMUM OF 1' BEHIND THE BACK-OF-CURB OR BEYOND EDGE OF PAVEMENT WHEN NO CURB IS PROPOSED.

CONCRETE CURB, SIDEWALK AND PAVEMENT SPECIFICATIONS, CONTINUED

- BAR SUPPORTS SHALL CONFORM TO THE BAR SUPPORT SPECIFICATIONS CONTAINED IN CONCRETE REINFORCING STEEL INSTITUTES' (CRSI) "MANUAL OF STANDARD PRACTICE." PROVIDE CHAIRS, SPACERS AND OTHER DEVICES SUITABLE FOR PROPER SPACING SUPPORTING AND FASTENING REINFORCING BARS.
- WHEN FORMS ARE USED AND THE CURB RADIUS IS LESS THAN 200 FEET, THE CURVED ALIGNMENT SHALL BE PROVIDED FOR BY EITHER STANDARD STEEL FORMS EQUIPPED WITH FLEXIBLE LINES OR BY FLEXIBLE FORMS. THE FORMS SHALL BE SO CLOSE TO THE FULL DEPTH OF THE SECTION, CURB AND GUTTER FORMS SHALL BE SO CONSTRUCTED AS TO PERMIT THE INSIDE OF THE FORMS TO BE SECURELY FASTENED TO THE OUTSIDE FORMS.
- ALL NEW CURB SHALL BE PLACED ONLY ON A PREPARED SUBGRADE, SMOOTH AND LEVELED TO THE GRADES ESTABLISHED BY THE ENGINEER.
- COMPACT AND CUT-TO-GRADE SUBGRADE UNDER FORMS SO THAT FORMS WHEN SET WILL BE UNIFORMLY SUPPORTED FOR THE ENTIRE LENGTH. SECURELY STAKE AND BRACE OR THE FORMS TO PREVENT LEAKAGE OF MORTAR. BRACING WITH EARTH WILL NOT BE PERMITTED.
- COAT SURFACES OF FORMS TO BE IN CONCRETE WITH A LIGHT CLEAR PARAFFIN OIL OR PARTING COMPOUND WHICH WILL NOT STAIN THE CONCRETE.
- THE INTERIOR SURFACES OF CONCRETE CONVEYING EQUIPMENT SHALL BE MAINTAINED FREE OF HARDENED CONCRETE, DEBRIS, WATER, SNOW, ICE AND OTHER DELTERIOUS MATERIALS.
- CURBING MAY BE CONSTRUCTED EITHER BY USE OF FORMS OR BY A MECHANICAL CURB AND DRAWER PAYER, PROVIDED THE REQUIRED FINISH, AND CROSS-SECTION, AS SHOWN ON GRAPHICS ARE OBTAINED. CONCRETE SHALL BE PLACED TO THE FULL DEPTH OF THE SECTION. CURB AND GUTTER FORMS SHALL BE STRIPPED TOPPING OR SAND-CEMENT DRIER. CONCRETE SHALL BE SPADED OR VIBRATED SUFFICIENTLY TO ENSURE SATISFACTORY CONSOLIDATION.
- PROVIDE REINFORCEMENT FOR CONCRETE CURB AS SHOWN ON THE DRAWINGS. REINFORCEMENT SHALL BE KEPT CLEAN AND FREE FROM OBJECTIONABLE RUST, BENDS OR KINKS IN REINFORCING BARS SHALL BE CORRECTED BEFORE PLACING. CURB REINFORCEMENT SHALL BE ACCURATELY LOCATED IN FORMS AND SECURELY HELD IN PLACE BEFORE AND DURING CONCRETE PLACING, BY SUPPORTS ADEQUATE TO PREVENT DISPLACEMENT DURING THE COURSE OF CONSTRUCTION.
- THE CONCRETE CURB SURFACE SHALL BE STRUCK OFF THE REQUIRED CROSS-SECTION WITH A TEMPLATE. AFTER THE CONCRETE CURB HAS BEEN FLOATED TO AN EVEN SURFACE, THE CONSTRUCTION JOINT SHALL BE CUT AND ALL SLAB EDGES ROUNDED WITH A 1/2 INCH RADIUS EDGING TOOL THAT WILL FINISH TO A WIDTH OF 2 INCHES. AFTER THE CONCRETE HAS SLIGHTLY SET, A BROOM SHALL BE BRUSHED LIGHTLY ACROSS THE SURFACE PARALLEL TO FORMS SO AS TO IMPART A ROUGH FINISH.
- CONSTRUCTION JOINTS SHALL BE CUT IN CONCRETE CURBING AT MINIMUM 10' INTERVALS. JOINTS SHALL ALSO BE LOCATED ADJACENT TO CURB DROPS.
- ISOLATION JOINTS SHALL BE PLACED IN CURBING AT TANGENT POINTS IN CURB RETURNS AT INTERSECTIONS, AT BOTH SIDES OF STRUCTURES LOCATED IN THE LINE AND IN RUNS OF CURB AT INTERVALS NOT EXCEEDING 40 FEET. ISOLATION JOINTS SHALL BE STRUCK OFF WITH A STRIPPER STRIP AS UNIFORM AS POSSIBLE AND SHALL EXTEND THE FULL DEPTH OF THE CONCRETE CURB SECTION. ISOLATION JOINTS SHALL BE PLACED IN CURB AT THE END OF EACH DAYS POUR AND WHEN ABUTTING PREVIOUSLY FLOURED CURB.
- THE CURING COMPOUND SHALL BE A WHITE PARAFFIN BASED COMPOUND SELECTED FROM MDOT'S QUALIFIED PRODUCTS LIST APPLIED AT 200 SQ FT/GAL.
- ALL CONSTRUCTION JOINTS IN CONCRETE CURB SECTIONS SHALL BE SEALED WITH EITHER HOT POURED JOINT SEALER OR COLD APPLIED JOINT SEALER.
- SLIGHTLY UNDERFILL JOINT GROOVE WITH JOINT SEALER TO PREVENT EXTRUSION OF THE SEALER. REMOVE EXCESS JOINT SEALER MATERIALS AS SOON AFTER SEALING AS POSSIBLE.
- FRESHLY PLACED CONCRETE SHALL BE PROTECTED AS REQUIRED TO MAINTAIN THE TEMPERATURE OF THE CONCRETE AT NOT LESS THAN 50 DEGREES F. NOR MORE THAN 80 DEGREES F. AND IN A MOST CONDITION CONTINUOUSLY FOR THE PERIOD OF TIME NECESSARY FOR THE CONCRETE TO CURE. CHANGES IN TEMPERATURE OF THE CONCRETE DURING CURING SHALL BE UNIFORM AS POSSIBLE AND SHALL NOT EXCEED 5 DEGREES F. IN ANY ONE HOUR, NOR 50 DEGREES F. IN ANY 24 HOUR PERIOD.
- COLD WEATHER PROTECTION: WHEN THE TEMPERATURE OF THE ATMOSPHERE IS 40-DEGREES F. AND BELOW, THE CONCRETE SHALL BE PROTECTED BY HEATING, INSULATION COVERING, OR COMBINATION THEREOF AS REQUIRED TO MAINTAIN THE TEMPERATURE OF THE CONCRETE BELOW 40-DEGREES F. AND IN A MOST CONDITION CONTINUOUSLY FOR THE CONCRETE CURING PERIOD. COLD WEATHER PROTECTION SHALL MEET THE REQUIREMENTS OF ACI 308R "COLD WEATHER CONCRETING".
- SUITABLE ADJUSTMENTS SHALL BE PROVIDED ON THE SPRAYER/SPRAYERS OF A MACHINE FOR PAINTING THE WIDTH REQUIRED. MULTIPLE PARALLEL PASSES TO PAINT THE REQUIRED WIDTH WILL NOT BE ALLOWED.
- EXISTING MARKINGS OR STRIPES WHICH ARE TO BE ABANDONED OR REMOVED SHALL BE OBLITERATED OR OBTURED BY THE BEST METHODS SUITED FOR THE PURPOSE AND TO THE SATISFACTION OF THE OWNER OR OWNER'S REPRESENTATIVE.
- THE CONTRACTOR IS RESPONSIBLE FOR LAYING OUT A SAMPLE SECTION OF STRIPING WHICH IS TO BE APPROVED BY THE OWNER OR OWNERS REPRESENTATIVE AS TO QUALITY BEFORE THE CONTRACTOR MAY PROCEED WITH THE STRIPING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSEQUENT STRIPING MEETS THE QUALITY OF THE APPROVED SAMPLE APPLICATION.
- ON THOSE SECTIONS OF PAVEMENTS WHERE NO PREVIOUSLY APPLIED FIGURES, MARKINGS, OR STRIPES ARE AVAILABLE TO SERVE AS A GUIDE, SUITABLE LAYOUTS AND LINES OF PROPOSED STRIPES SHALL BE SPOTTED IN ADVANCE OF THE PAINT APPLICATION. CONTROL POINTS SHALL BE SPACED AT SUCH INTERVALS AS WILL ENSURE ACCURATE LOCATION OF ALL MARKINGS.
- MARKINGS SHALL BE APPLIED AT THE LOCATIONS AND TO THE DIMENSIONS AND SPACING INDICATED ON THE PLANS OR AS SPECIFIED. PAINT SHALL NOT BE APPLIED UNTIL THE INDICATED ALIGNMENT IS LAID OUT AND THE CONDITIONS OF THE EXISTING SURFACE HAVE BEEN APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE.
- THE PAINT SHALL BE MIXED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS BEFORE APPLICATION. THE PAINT SHALL BE THOROUGHLY MIXED AND STRIPPED TO THE SURFACE TO INSURE THAT THE MARKING MACHINE AT ITS ORIGINAL CONDITION WITHOUT THE ADDITION OF THINNER. IF THE PAINT IS APPLIED BY BRUSH, THE SURFACE SHALL RECEIVE TWO (2) COATS: THE FIRST COAT SHALL BE THOROUGHLY DRY BEFORE THE SECOND COAT IS APPLIED.
- A MINIMUM OF ONE (1) WEEK SHALL ELAPSE BETWEEN APPLICATION OF THE BITUMINOUS SEAL COAT, SLURRY SEAL OR THE PLACEMENT OF THE BITUMINOUS SURFACE COURSE AND THE MARKING OF THE PAVEMENT. THE PAINT SHALL NOT BLEED EXCESSIVELY, CURL, OR DISCOLOR WHEN APPLIED TO BITUMINOUS OR CONCRETE SURFACES. CURB COMPOUND MUST BE REMOVED FROM THE ENTIRE WIDTH OF THE PAINTED STRIPE OR SYMBOL PRIOR TO PAINTING NEW CONCRETE.
- IN THE APPLICATION OF STRAIGHT STRIPES, ANY DEVIATION IN THE EDGES EXCEEDING 1/2-INCH IN 50- FEET SHALL BE OBLITERATED AND THE MARKING CORRECTED. THE WIDTH OF THE MARKINGS SHALL BE AS DESIGNATED WITHIN A TOLERANCE OF 5 PERCENT (5%). ALL PAINTING SHALL BE PERFORMED TO THE SATISFACTION OF THE OWNER OR OWNER'S REPRESENTATIVE BY COMPETENT AND EXPERIENCED EQUIPMENT OPERATORS, LABORERS, AND ARTISANS IN A NEAT AND WORKMANLIKE MANNER.
- PAINT SHALL BE APPLIED UNIFORMLY BY SUITABLE EQUIPMENT AT A RATE OF 0.094 GAL./SQ. FT. FOR STENCILS AND 0.00313 GAL./FT. FOR STRIPING. PAINT APPLICATION SHALL PRODUCE AN AVERAGE WET FILM THICKNESS OF 0.015-INCHES.
- AFTER APPLICATIONS OF THE PAINT, ALL MARKINGS SHALL BE PROTECTED WHILE THE PAINT IS DRYING. THE FRESH PAINT SHALL BE PROTECTED FROM INJURY OR DAMAGE OF ANY KIND. THE CONTRACTOR SHALL BE DIRECTLY RESPONSIBLE AND SHALL ERECT OR PLACE SUITABLE WARNING SIGNS, FLAGS, OR BARRICADES. PROTECTIVE SCREENS OR COVERINGS AS REQUIRED TO PROTECT SURFACES SHALL BE PROTECTED FROM DISFIGURATION BY SPATTER, SPLASHES, SPILLAGE, DRIPPINGS OF PAINT OR OTHER MATERIAL.

CONCRETE CURB, SIDEWALK AND PAVEMENT SPECIFICATIONS, CONTINUED

- ISOLATION PAPERS SHALL BE OF THE PRE-MOLDED, NON-EXTRUDING, ASPHALT IMPREGATED TYPE NOT LESS THAN 1/2-INCH THICK. THE LENGTH SHALL BE EQUAL TO THE WIDTH OF THE SLAB, AND THE DEPTH EQUAL TO THE THICKNESS OF THE SLAB PLUS 1-INCH.
- ISOLATION JOINTS SHALL BE PLACED AT THE FOLLOWING LOCATION FOR SIDEWALKS AND CONCRETE PAVEMENTS:
 - AT THE BACK OF THE CURB AND FRONT EDGE OF THE SIDEWALKS AND PAVEMENT SLABS ADJACENT TO EACH DRIVEWAY APPROACH AND SERVICE WALK.
 - AT INTERVALS NOT TO EXCEED 50- FEET IN ALL PUBLIC SIDEWALKS.
 - AT THE BACK OF THE CURB WHERE THE RAMPS EXTEND FROM THE KEY FLAG TO THE PAVEMENT.
 - BETWEEN THE KEY FLAG AND THE RAMP IN ALL CASES, EXCEPT WHERE THERE ARE EXISTING EXPANSION JOINTS AT THE INTERSECTIONS OF THE SIDEWALKS AND THE KEY FLAG.
 - AT ANY PLACE WHERE A SIDEWALK OR CONCRETE PAVEMENT ABUTS A BUILDING OR FIXED STRUCTURE.
 - AT ANY OTHER LOCATIONS INDICATED ON THE PLAN.
- CONSTRUCTION JOINTS IN THE CONCRETE PAVEMENT WILL BE AS FOLLOWS:
 - TRANSVERSE JOINTS SHALL BE AT MAXIMUM 10-FOOT INTERVALS OR AS SHOWN ON PLANS AND DETAILS.
 - LONGITUDINAL JOINTS SHALL BE AT MAXIMUM 12-FOOT INTERVALS OR AS SHOWN ON PLANS AND DETAILS.
- PRIOR TO APPLYING JOINT SEALER, CLEAN JOINT GROOVE OF FOREIGN MATTER AND LOOSE PARTICLES, AND DRY SURFACE.

TRAFFIC LANE AND PARKING LOT MARKING

- PROVIDE ALL MATERIALS, LABOR, EQUIPMENT, AND SERVICES NECESSARY TO COMPLETE ALL TRAFFIC LANE AND PARKING LOT MARKINGS AS INDICATED IN THE CONSTRUCTION DOCUMENTS.
- WORK INCLUDES, BUT NOT LIMITED TO PAINTING OF LETTERS, MARKINGS, STRIPES AND ISLANDS ON THE PAVEMENT SURFACE APPLIED IN ACCORDANCE WITH THIS SPECIFICATION AND AT THE LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
- THE PAINT SHALL MEET THE REQUIREMENTS OF FEDERAL SPECIFICATION TT-P-115C(3), WITH OR WITHOUT REFLECTORIZED BEADS AS REQUIRED ON THE PLANS.
- COLOR SHALL BE AS SPECIFIED ON THE PLANS OR AS FOLLOWS:
 - TRAFFIC LANE STRIPING SHALL BE WHITE OR YELLOW REFLECTORIZED, AS SHOWN ON THE PLANS.
 - TRAFFIC MARKING AND CURB FACES SHALL BE WHITE UNLESS NOTED OTHERWISE.
 - PARKING LOT STRIPING SHALL BE WHITE, UNLESS NOTED OTHERWISE.
 - HANDICAP STALL STRIPING MEETING CURRENT ADA REQUIREMENTS SHALL BE BLUE UNLESS NOTED OTHERWISE.
- THE PAINTING SHALL BE PERFORMED ONLY WHEN THE EXISTING SURFACE IS DRY AND CLEAN, WHEN THE ATMOSPHERIC TEMPERATURE IS ABOVE 40-DEGREES F. AND WHEN THE WEATHER IS CLEAR AND DRY. PAINTING SHALL NOT BE PERFORMED WHEN RAIN IS NOT FORECASTED FOR AT LEAST 2 HOURS AFTER PAINT IS APPLIED.
- ALL EQUIPMENT FOR THE WORK SHALL BE APPROVED BY THE CONTRACTOR AND SHALL INCLUDE THE APPARATUS NECESSARY TO PROPERLY CLEAN THE EXISTING SURFACE. A MECHANICAL MARKING MACHINE, AND SUCH AUXILIARY HAND EQUIPMENT AS MAY BE NECESSARY TO SATISFACTORILY COMPLETE THE JOB.
- THE MECHANICAL MARKER SHALL BE AN APPROVED AUTOMATIC SPRAY-TYPE MARKING MACHINE SUITABLE FOR APPLICATION OF TRAFFIC PAINT. IT SHALL PRODUCE AN EVEN AND UNIFORM FILM THICKNESS AT THE REQUIRED COVERAGE AND SHALL BE DESIGNED SO AS TO APPLY MARKINGS OF UNIFORM CROSS-SECTIONS AND CLEAR-CUT EDGES WITHOUT RUNNING OR SPATTERING AND WITHIN THE L LIMITS FOR STRAIGHTNESS SET FORTH HEREIN. WHEN NEEDED, A DISPENSER SHALL BE FURNISHED, WHICH IS PROPERLY DESIGNED FOR ATTACHMENT TO THE MARKER AND SUITABLE FOR DISPENSING THE REQUIRED QUANTITY OF REFLECTIVE BEADS.
- SUITABLE ADJUSTMENTS SHALL BE PROVIDED ON THE SPRAYER/SPRAYERS OF A MACHINE FOR PAINTING THE WIDTH REQUIRED. MULTIPLE PARALLEL PASSES TO PAINT THE REQUIRED WIDTH WILL NOT BE ALLOWED.
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- AFTER APPLICATIONS OF THE PAINT, ALL MARKINGS SHALL BE PROTECTED WHILE THE PAINT IS DRYING. THE FRESH PAINT SHALL BE PROTECTED FROM INJURY OR DAMAGE OF ANY KIND. THE CONTRACTOR SHALL BE DIRECTLY RESPONSIBLE AND SHALL ERECT OR PLACE SUITABLE WARNING SIGNS, FLAGS, OR BARRICADES. PROTECTIVE SCREENS OR COVERINGS AS REQUIRED TO PROTECT SURFACES SHALL BE PROTECTED FROM DISFIGURATION BY SPATTER, SPLASHES, SPILLAGE, DRIPPINGS OF PAINT OR OTHER MATERIAL.

STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
 ADAM P. LACH, R.A. DIRECTOR
 816 E 4th St. #8087
 248-642-7866/www.eptoc.com
FORBES CONSULTANTS, INC.
 PROJECT: WASHTEAW ARMYRY - CONSTRUCTION ADDITION
 DESIGNED: DT
 DRAWN: CHECKED: TOS
 DATE: 04/01/2022
 ISSUED FOR: CONSTRUCTION DOCUMENTS
 IDENTIFICATION NUMBER: PROJECT: WASHTEAW ARMYRY CONTRACT NUMBER: Y21456 FILE NO. 517/21326.0AK DWA PROJECT NO. 268392016
 SHEET NUMBER: 20 OF 96
 DRAWING TITLE: SPECS
 C-12.1



Allan W. Pruss

GENERAL NOTES:

- BUILDING CODE: Design and loads in accordance with latest adopted edition International Building Code, federal and state OSHA, Michigan Building Code, and ASCE-7.
- DESIGN LOADS AND CRITERIA (MICHIGAN BUILDING CODE 2015)

ROOF LOADS			
Roof Dead	30 psf	(20 psf + 10 psf Mechanical & Electrical)	
Roof Live	20 psf		
SNOW LOAD			
Ground SL	25 psf		
Flat Roof SL	20 psf		
Exposure Factor	1.0		
Risk Category	II		
Thermal Factor	1.0		
Drift Included			
WIND LOAD			
Basic Wind Speed	115 mph		
Risk Category	II		
Exposure Category	B		
Building Class	Enclosed		
Method	Envelope Method		
Design Pressures:			
MWFRS, Wall	+11.7, -9.5 psf	(interior zone)	
	+15.9, -12.3 psf	(edges)	
C&C, Wall	+19.6, -21.4 psf	(interior zone)	
	+19.6, -24.7 psf	(edges)	
C&C, Parapet	39.3 psf	(combined)	
Roof Uplift	10 psf		
SEISMIC LOAD			
Seismic Design Cat	B		
Site Class	D		
Risk Category	II		
SDS	0.112		
SD1	0.076		
RESISTING SYSTEM	ORDINARY REINFORCED MASONRY SHEAR WALL		
- STRUCTURE STABILITY: The structure is designed to be stable and self-supporting ONLY after all components are completely installed. Erector is solely responsible for determining erection sequence and procedure to ensure stability during construction. This shall include all temporary shoring and bracing, to remain in place until all components are in place and complete.

GENERAL DEMOLITION NOTES:

- CONCRETE REMOVAL: Wet materials during breaking and handling of demolished concrete and during earthwork operations to minimize creation and spread of dust. Sawcut, break-up, and remove existing slabs, walls, and foundations as shown and excavate to the subgrade elevations indicated. Dispose of all excess material, trash, debris, and waste off of the Owner's property in an authorized disposal site.

MASONRY NOTES:

- STANDARDS: Conform to the latest editions: ACI 530 'Building Code Requirements for Structural Masonry' and ACI 530.1 'Specifications for Masonry Structures'
- MATERIAL: All concrete masonry units shall be normal weight with two cells and conform to ASTM C90. All brick masonry units shall conform to ASTM C216. Refer to architectural drawings for size and color. All mortar shall conform to ASTM C270. All grout shall conform to ASTM C476.
- STRENGTH: The minimum specified net area compressive strength of masonry shall be f'm = 2,500 psi and shall consist of the following components:

Individual CMU unit:	3,250 psi minimum net area compressive strength
Individual brick unit:	4,400 psi minimum net area compressive strength
Grout:	2,500 psi minimum compressive strength

 Mortar shall conform to ASTM C-270 Portland Cement, Type S
- STEEL BAR REINFORCEMENT: ASTM A615, grade 60. Install vertical reinforcing as noted on plans in the center of block cores and grout in maximum of 48" heights. Reinforcement splices shall be placed in accordance with ACI 530. All field bending shall be done cold, heating of bars is NOT permitted.
- HORIZONTAL REINFORCEMENT: Reinforced concrete block walls shall have 220 standard ladder type horizontal reinforcing installed at every other course (16" spacing). Unreinforced concrete masonry unit walls shall have 120 Truss Mesh, or equivalent, standard truss-type horizontal reinforcing installed at every other course (16" spacing). Horizontal wire reinforcement shall be #9 galvanized wire with ATM A-641 galvanized coating unless noted otherwise. Do not extend horizontal joint reinforcing through control joints.
- VENEER TIE REINFORCEMENT: Masonry veneer shall be tied to the CMU with Heckman Pos-I-Tie brick veneer anchoring system, with 3/16" diameter hot-dipped galvanized triangular wire ties spaced a maximum of 24" o.c. horizontally and 16" o.c.
- CMU DETAILS: All block shall be laid in running bond. All masonry units below grade shall be grouted solid. All cores with reinforcing steel shall be grouted solid, full height of wall.
- BRICK DETAILS: Brick work shall have proper ties to the structure, flashing, weepholes, etc in accordance with the most recent specifications of the BIA and MBC.
- CONTROL JOINTS: See architectural drawings for control joint locations. Reinforcing in bond beams shall be discontinuous at control joints.
- BEARING: Steel beams bearing on masonry walls shall have 7.5"x7.5"x3/8" steel bearing plates with (2) 1/2" diameter x 6" long headed studs, u.n.o. The top three courses of block below the bearing plate shall be grouted solid. Steel lintels supporting masonry from the bottom flange shall have a continuous 5/16" steel plate welded to the bottom flange as required, u.n.o.
- STRUCTURE STABILITY: The masonry contractor is solely responsible for the design and installation of temporary shoring and falsework required to withstand wind loads and temporary construction loads. Work performed shall be in accordance with OSHA requirements.

CAST-IN-PLACE CONCRETE NOTES:

- STANDARDS: Conform to the latest editions: ACI 'Manual of Standard Practice'; 'Specifications for Structural Concrete for Buildings' (ACI 301), 'Building Code Requirements for Reinforced Concrete' (ACI 318); ACI 'Manual of Standard Practice for Detailing Reinforced Concrete Structures' (SP-66);
- CONCRETE MIX: All concrete shall have the following 28 day compressive strength and air entrainment:

LOCATION	STRENGTH	AIR ENTRAINMENT
Wall footings	3000 psi	1-2%
All concrete exposed to freeze/thaw	4000 psi	6%
Interior slabs on grade	4000 psi	Non-AE

 Limit slump to 1" minimum, 4" maximum. Use of fly ash (ASTM A618 Type F), limited to less than 25% by weight of cement. GGBFS (ASTM C989 Type 100) may only be used with prior approval from Engineer. Submit mix designs to Engineer for approval prior to starting
- CONCRETE ADMIXTURES: Do not use calcium chloride or admixtures containing more than 0.15% soluble chloride ion content by weight of cement. When multiple admixtures are used Contractor shall coordinate with all manufacturers to insure compatibility.
- STEEL BAR REINFORCEMENT: ASTM A615, grade 60. Compression splices shall be minimum 30 bar diameters, tension splices shall be class B. Consider all horizontal wall bars as 'top bars'. Welded wire fabric reinforcement shall conform to ASTM A-185 (smooth wire Fy=60 ksi, deformed wire Fy=70 ksi), with laps of (2) wire spaces, minimum 8". Welded steel rod mat reinforcing per ASTM A184 may be submitted as alternate to steel bar reinforcing for review. At all openings in walls and slabs over 12" in the longest dimension, provide (2) #5 bars all around. Provide vertical dowels from wall footings to walls of same size and spacing as vertical reinforcing, and offset for splice as required. All field bending shall be done cold, heating of bars is NOT permitted.
- SLAB ON GRADE: Where existing slab on grade is to be removed and replaced, provide new 4" slab on 6" compacted engineered fill. Reinforce with (1) layers 6x6-W1.4xW1.4 w.w.f, placed at the slab center. Installer may substitute alternate reinforcing bar or wire size, gage and spacing of equivalent area.
- CONNECTION TO EXISTING WORK: Where new work abuts existing construction, clean and roughen existing surface and coat with epoxy bonding agent (ASTM C881) prior to placing new concrete (Sika 'Sikadur 32 Hi-Mod'). Provide dowels to match size and spacing of new reinforcing, minimum #4 @ 12" c/c, 2'-0" long, drilled and grouted to existing using HILTI HVA Adhesive System. Dowels shall use manufacturer's standard embedment, minimum 4-1/4", into existing.
- FLOOR AND WALL JOINTS: Maximum 20'-0" in each direction. All construction joints shall have formed key on center of member, minimum 2" x 4" x 3/4" deep unless noted. Reinforcing shall be continuous through key.
- BUILT IN WORK: Install beams, angle edgings, inserts, sleeves, anchor bolts, etc., furnished by other trades or the Owner. Steel shapes and plate shall conform to ASTM A36; Pipe steel ASTM A53/E/B. Anchor Rods and Anchor Bolts ASTM F1554 Grade 36. See General Steel Notes for additional information.
- ANCHORS FOR BUILT IN WORK: Anchors for embedded steel shall be minimum 3/16 x 2 x 6 x 2 return straps or 3/4" diameter x 6" long headed studs (ASTM A108) spaced at 24" c/c, u.n.o.
- CONCRETE ANCHORS: Minimum 3/4" diameter expansion type, epoxy adhesive type or coarse thread screw anchor as indicated. Unless noted otherwise provide manufacturers standard embedment for each type; minimum 4 1/4" for expansion type, 6 5/8" for epoxy type, or 4" for screw anchor type. Expansion anchors shall be 'KB3'; Epoxy anchors 'HAS Standard rod with HVA Adhesive' or 'HIT HY-200; Screw Anchors Kwik HUS-EZ'; Hollow masonry wall face shell anchors 'HIT HY-20. Products of Hilti Corporation, or approved equal. All anchors within 8" of an edge shall be epoxy type
- MASONRY ANCHORS: Hollow masonry wall face shell anchors 'HIT HY-20' of Hilti Corporation, or approved equal, minimum 3/4" diameter.
- LEVELLING BEDS: Grout miscellaneous items as required to level at proper elevation with cementitious non-shrink grout conforming to ASTM C-1107, grade C. Minimum 28-day compressive strength 7,000 psi; 'Five Star Grout' or 'Five Star Instant Grout' of U.S. Grout Corp., or approved equal.
- DOOR RECESSES: Step top of foundation walls and grade beams down at door openings, ramps, etc. for supporting thickened floor slabs and to receive door jambs. Depth shall be 4" greater than slab thickness.
- FORMS AND REINFORCING: Provide CRSI approved metal or plastic supports as required to rigidly and accurately hold reinforcing steel and built in work in place as shown to avoid displacement during concrete placement. Wood, masonry, brick or other scrap material may NOT be used for supporting reinforcing. Clean formwork of all laitance and debris, and protect prior to placing concrete. All exposed edges shall have minimum 3/4", 45 degree chamfer.
- CURING: Keep concrete wet for not less than (7) days for type I cement, (3) days for type III cement by covering with an approved water saturated covering or any other approved method that will keep all surfaces continuously (not periodically) wet.
- BACKFILLING WALLS: Backfill both sides of foundation walls simultaneously. Differential elevation between lifts between each side of walls shall not exceed 18".
- FORMED SURFACES: Remove projections from all exposed surfaces and cut back all metal form ties and spreaders 1-1/2" from the surface of the concrete. All holes or honeycombs shall be pointed with patching mortar or cement.
- SEALANTS / JOINT MATERIALS: Expansion joint material shall be 1/2" thick asphalt impregnated fiberboard conforming to ASTM D1751. Joint sealant shall be cold-applied, jet-fuel resistant type complying with ASTM C920, grade P, class 25, use T; 'MasterSeal CR125 or SL2' of BASF for interior surfaces, and hot poured elastic type conforming to ASTM D3405 'Hi-Spec Polymeric Joint Sealing Compound' of W.R. Meadows for horizontal exterior surfaces, or approved equal. Construction and control joint filler shall be 'Sure-Fil (J-52)' of Dayton Superior. Provide backer rods as recommended by sealer manufacturer.
- DEWATERING: Installer shall provide all necessary measures to keep the area of work drained and free from accumulation of surface water at all times. Provide and operate pumps, pumping equipment, etc., as required to maintain excavations free from water for new construction until completion of work.
- FINISH: Exposed, formed surfaces shall have smooth form finish. Slabs shall receive float and steel trowel finish. Exterior slabs shall have fine broom finish in direction of slope. Exterior ramps shall have fine broom finish, perpendicular to slope. Finish slabs and flatwork to minimum tolerance of F(f) 30 and F(l) 25 in accordance with ASTM E 1155.

FOUNDATION NOTES:

- STANDARDS: Conform to the latest editions: ACI 'Manual of Standard Practice'; 'Specifications for Structural Concrete for Buildings' (ACI 301), 'Building Code Requirements for Reinforced Concrete' (ACI 318); ACI 'Manual of Standard Practice for Detailing Reinforced Concrete Structures' (SP-66);
- SOIL BEARING DATA: Soil data based on geotechnical investigation and report performed by Hartley Geotechnical Group. Design gross bearing pressure = 3000 psf.
- FOUNDATION DESIGN: Foundations shall bear on natural materials with allowable gross bearing capacity of 3000 psf. (field verify by qualified testing agency). If materials of this capacity are not found at the elevations indicated, lower or enlarge foundations as directed by the Engineer. Steps in continuous footings shall not exceed a ratio of 2/1 (horiz/vert). Foundations shall be centered on supports unless otherwise noted
- Where new footings abut existing footings, carefully hand excavate to match bottom of existing footing elevations. New footing shall not be lower than existing footing without protection against undermining such as underpinning or shoring. Contact engineer if existing footing conditions differ from anticipated.
- EXCAVATION LIMITS: Extent of excavation shown on plan is for bidding purposes. Contractor is responsible for means and methods of construction, and coordination of work for any changes made from the design drawings (i.e. reinforcing bar lengths, etc.).
- Contractor shall verify all conditions, including underground utilities and field measurements, and report any discrepancies to Owner's representative.
- FILL AND/OR BACKFILL: Engineered fill consisting of approved granular materials; ASTM soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3" in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Place at +/- 2% of optimum moisture content in maximum lifts of 9" loose thickness. Compact to not less than 95% of the maximum dry density, determined per ASTM D1557. Slabs on grade shall bear on minimum 6" compacted fill, u.n.o.
- FLOWABLE FILL: Controlled Low Strength Material (CLSM) may be used in place of backfill and for abandoned pits and piping. Conform to requirements of ACI 229. Minimum compressive strength of 100 psi at 7 days as measured by 2" by 2" cubes. Minimum cement content (per cubic yard) of 100 Lbs. Portland cement, 1,450 Lbs. Type F fly ash, and water to provide minimum slump of 10.
- No foundations or slabs shall be placed on or against subgrade containing free water, frost or ice.
- Provide de-watering equipment to maintain a dry excavation as needed until backfill is complete.



DRAWING NUMBER S-001	DRAWING TITLE STRUCTURAL NOTES AND SPECIFICATIONS	SHEET NUMBER 21 OF 96	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMOY CONTRACT NUMBER: Y21456 FILE NO. 511/71326.CAK DWA PROJECT NO. 26C8022016	ISSUED FOR 100% CONSTRUCTION DOCUMENTS	DATE 02/09/2022	DESIGNED RS CHECKED RS APPROVED RS	PROJECT RENOVATE ARMOY WASHTEAW ARMOY	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, P.E., DIRECTOR
								816 E 4th ST. Royal Oak, MI 48067 248-542-7866 / www.gtao.com

STRUCTURAL STEEL NOTES:

- STRUCTURE STABILITY:** The structure is designed to be stable and self-supporting ONLY after all components are completely installed. Erector is solely responsible for determining erection sequence and procedure to ensure stability during construction. This shall include all temporary shoring and bracing, to remain in place until all components are in place and complete.
- STANDARDS:** Fabrication, and erection of steel work shall conform to the latest edition AISC 'Specification for Structural Steel Buildings' (ANSI/AISC 360) – Allowable Stress Design; 'Manual of Standard Practice (AISC 303); RCSC 'Specification for Structural Joints Using High Strength Bolts (AISC 348)'; and 'Structural Welding Code –Steel' (AWS D1.1).
- MATERIALS:** Miscellaneous steel and framing angles shall conform to ASTM A36: Wide flange steel shapes ASTM A992 (Fy = 50 ksi); Anchor Rods and Anchor Bolts ASTM F1554 Grade 36; Tube steel ASTM A500 Gr B (Fy = 46 ksi). Headed shear studs ASTM A1044, minimum 3/4" diameter, Nelson S3L of Nelson Stud Welding, or approved equal.
- STEEL JOISTS AND BRIDGING:** Conform to SJI standards. Joists are shown at maximum design spacing and shall be equally spaced along supports, u.n.o. Shim at supports or provide deeper ends as required. Provide (1) additional row of horizontal bottom chord bridging at the first bottom chord panel point where net uplift loads are noted. Where joists occur on column lines, extend bottom chord and connect to column.
- CONNECTIONS:** Shop connections shall be welded, field connections bolted. Connections to existing steel shall be field drilled and bolted, u.n.o. Minimum (2) 3/4" diameter ASTM A325 high strength bolts in bearing type connection with threads included in shear plane (type N). Extend bottom of connection below member centerline, with top of connection within 3" of the top of member, unless noted. All bolts shall have heavy hex nuts (ASTM A563) and hardened washers (ASTM F436) where required. Lock washers are NOT permitted. Where single angle or plate connections are used, use minimum 3/8" thick material. Bolts used in tension or forming part of the bracing system shall be SC type, except clamped connections.
- BOLTS AND WELDS:** Tighten bolts 'snug-tight', unless noted otherwise in bolt spec. Welding shall conform to AWS standards using certified operators, with E70xx electrode (u.n.o.). Minimum fillet weld size 3/16" for all strength welds unless otherwise indicated in reference specification. All welds shall be continuous unless noted otherwise. Exposed exterior construction shall have continuous seal welds at all joints in addition to strength welds. Obtain Owner approval and burn permit prior to field welding or cutting. Maintain continuous fire watch during all field welding and cutting operations.
- STEEL DECKING:** Minimum 20 gage (0.0358") galvanized material, unless noted otherwise. Roof decking shall be 1-1/2" wide rib (Type B). Decking sized for (3) span condition. Fasten to steel supports per SDI guidelines with minimum (3) connections per section at each support, maximum 12" c/c (pattern 36/4) and (1) sidelap fastener per span. Sidelaps shall be nested. Fastener strength shall be equivalent to 5/8" diameter puddle welds at spacing noted. For galvanized deck use mechanical fasteners. Adjust spacing as required to maintain strengths noted. Mechanical deck fasteners shall be low velocity 'Air/Safe Fastening' system of Pneutek with minimum 5/16" diameter head, 0.15" diameter shank, 2" long
- CONCRETE ANCHORS:** Minimum 3/4" diameter expansion type, epoxy adhesive type or coarse thread screw anchor as indicated. Unless noted otherwise provide manufacturers standard embedment for each type; minimum 4 1/4" for expansion type, 6 5/8" for epoxy type, or 4" for screw anchor type. Expansion anchors shall be 'KB3'; Epoxy anchors 'HAS Standard rod with HVU Adhesive' or 'HIT HY-200; Screw Anchors Kwik HUS-EZ'. Products of Hilti Corporation, or approved equal. All anchors within 8" of an edge shall be epoxy type.
- MASONRY ANCHORS:** Hollow masonry wall face shell anchors 'HIT HY-20' of Hilti Corporation, or approved equal, minimum 3/4" diameter.
- LEVELING BEDS:** Grout miscellaneous items as required to level at proper elevation with cementitious non-shrink grout conforming to ASTM C-1107, grade C. Minimum 28-day compressive strength 7,000 psi; 'Five Star Grout' or 'Five Star Instant Grout' of U.S. Grout Corp., or approved equal.
- OPENINGS:** Frame free edges of all roof and floor openings larger than 24" x 24" with C6 x 8.2 frame, u.n.o. Use L4x4x1/4 frame for smaller openings. Coordinate with other trades for exact size and location prior to fabrication.
- MISCELLANEOUS FRAMING:** Provide shelf angles at top of columns, spandrel beams and elsewhere as required to support free edges of metal deck. Refer to architectural drawings for additional clips and plates required for miscellaneous framing.
- PREPARATION:** Clean steel of all mill scale, loose rust, spatter, slag, and foreign matter per SSPC SP-2, SP-3 or SP-6 prior to painting. For exterior applications use SP-6 only. Lead paint removal and disposal at existing construction shall be performed per all federal and local regulations. Shop prime paint all structural steel with 2.0 mil minimum thickness of rust-inhibitive lead and chromate free primer paint, SSPC Paint 25, light grey or white.
- FABRICATION:** Conform to tolerances of referenced specifications. All members shall be continuous for entire length between supports, u.n.o. NO members may be spliced without Engineer's written approval, and ONLY outside middle 1/3 of span. Fabricate members with the natural camber up. Cut member ends square. Compression members shall be milled for full contact at bearing ends. Double angles shall be long legs vertical (LLV), back to back. Holes shall be cut, punched or drilled perpendicular to surface, burning is NOT permitted.
- DETAILING:** Unless indicated otherwise use standard hole size and spacing for all connections. Holes shall be 13/16" diameter for 3/4" bolts, 11/16" diameter for 5/8" bolts. Space adjacent fasteners 3" center-center, on standard member gage lines. End distance 1 1/4". All beam bearing connections and beams over columns shall be provided with (4) H.S. bolts and full depth fitted 3/8" thick stiffener plates each side aligned with column faces or web. Beam bearing plates shall be 1/2" thick, u.n.o. Column cap plates shall be minimum 1/2" thick, baseplates 3/4" thick, u.n.o. Vertical bracing shall be located on centerline of support, unless noted.
- FIELD WORK:** Members shall NOT be altered in the field from that shown on design and fabrication drawings without Engineer's written approval. Mismatched holes shall be reamed to a larger diameter.
- GALVANIZED FINISHES:** Hot dip galvanize members all exterior and exposed members (including lintels in exterior walls) and where indicated. ASTM A123 for fabricated steel products; ASTM A153 Class C hardware, ASTM B695 Class 50 for fasteners. Touch up damaged galvanized surfaces with hand applied galvanizing repair paint, SSPC Paint 20.
- FINISHING:** Erector shall apply touch up paint after erection to areas where shop coating has been damaged, to all field bolts, welds, and other unpainted areas using same paint as shop coat. Finish members with minimum 2.0 mil thickness of full gloss alkyl-enamel paint, minimum (2) coats for exterior members (FS-TT-E-489). Colors shall match adjacent existing finishes.

OPEN WEB STEEL JOIST NOTES:

- STANDARDS:** Conform to SJI standards. Joists are shown at maximum design spacing and shall be equally spaced along supports, u.n.o. Shim at supports or provide deeper ends as required.
- Steel joist manufacturers shall be members of the Steel Joist Institute (SJI).
- Where noted, joists shall be designed for additional distributed and concentrated loads as noted.
- BRIDGING:** Provide bridging to meet the requirements of SJI, including wind uplift considerations, unless detailed otherwise. Horizontal bridging shall be continuous top and bottom, anchored at each end, and welded to each joist. Diagonal bridging shall be bolted to each joist and clamped at the intersection with opposite bridging. Provide (1) additional row of horizontal bottom chord bridging at the first bottom chord panel point where net uplift loads are noted.
- CAMBER:** Joists shall be cambered for deflection due to dead loads unless noted otherwise.
- DEFLECTION:** Live load deflection or joists shall not exceed L/360
- SHOP DRAWINGS:** Submit shop drawings and calculations with erection plans, details and diagrams showing joist loading and camber for Engineer's review. Shop drawings and calculations shall be sealed by an engineer registered in the state of Michigan.
- COATINGS:** Joists shall receive one coat of primer except those receiving fireproofing. See architectural drawings.

STEEL DECKING NOTES:

- STANDARDS:** Conform to Steel Deck Institute (SDI) specifications, latest edition.
- Manufacturer shall be a member of the Steel Deck Institute.
- STEEL DECKING:** Minimum 20 gage (0.0358") galvanized material (ASTM A653), unless noted otherwise. Roof decking shall be 1-1/2" wide rib (Type B). Decking sized for (3) span condition. Fasten to steel supports per SDI guidelines with minimum (3) connections per section at each support, maximum 12" c/c (pattern 36/4) and (1) sidelap fastener per span. Sidelaps shall be nested. Fastener strength shall be equivalent to 5/8" diameter puddle welds at spacing noted. For galvanized deck use mechanical fasteners. Adjust spacing as required to maintain strengths noted. Mechanical deck fasteners shall be low velocity 'Air/Safe Fastening' system of Pneutek with minimum 5/16" diameter head, 0.15" diameter shank, 2" long
- Contractor to provide all necessary accessories including closures, screed angles and girder fillers as required to contain the slab concrete and as required to adequately support the metal deck on all sides of the steel framing.
- No loads are permitted to hang from roof deck. Hangers for ceilings, ductwork, electrical conduit, piping, etc shall be hung directly from structural members or supplemental steel framing.

SPECIAL INSPECTIONS:

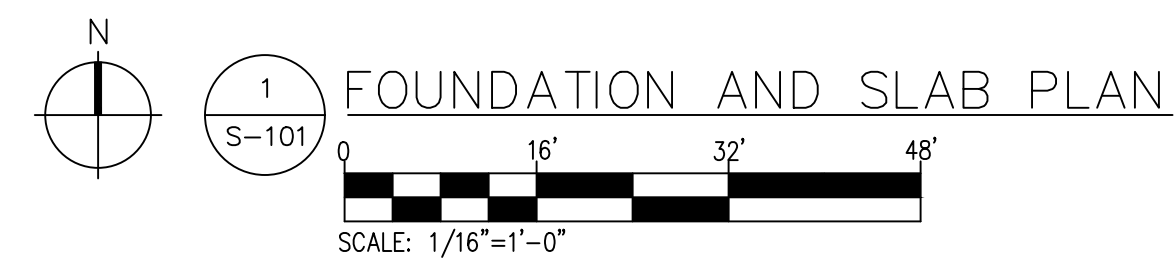
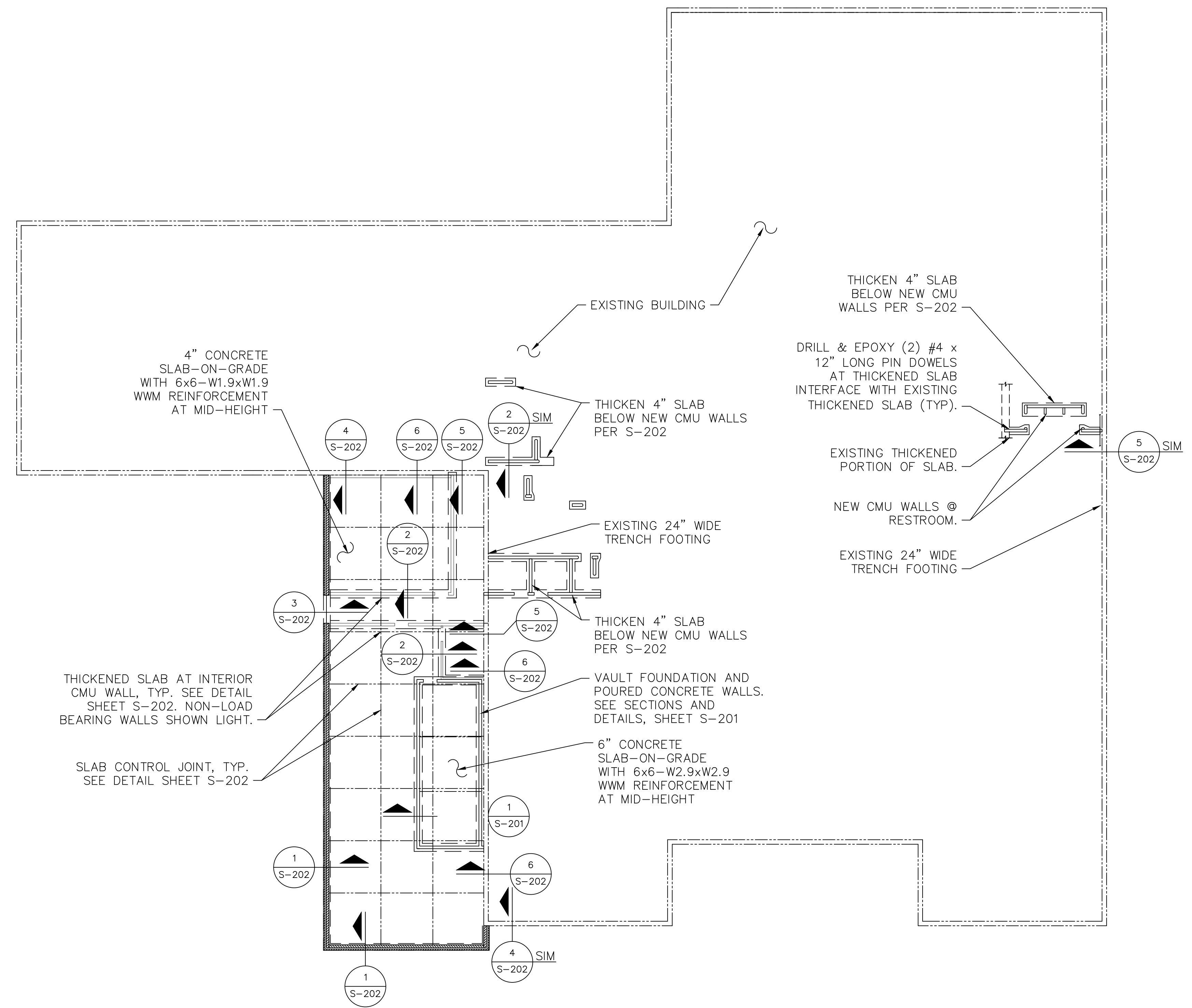
- All inspections shall be performed in accordance with the 2015 Michigan Building Code.
 - Steel Construction: Table 1705.2
 - Concrete Construction: Table 1705.3
 - Masonry Construction: Table 1705.4
 - Soil Inspections: Table 1705.6



DRAWING NUMBER S-002	DRAWING TITLE STRUCTURAL NOTES	SHEET NUMBER 22 OF 96	IDENTIFICATION NUMBER PROJECT: WASHTEENAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.CAK DWG PROJECT NO. 26C8022016	ISSUED FOR 100% CONSTRUCTION DOCUMENTS	DATE 03/09/2022	DESIGNED RS CHECKED RS APPROVED RS	PROJECT RENOVATE ARMORY WASHTEENAW ARMORY	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET DIVISION OF CONSTRUCTION DESIGN AND CONSTRUCTION DIVISION ADAM P. LAKE, P.E., DIRECTOR
	816 E 4th ST. Royal Oak, MI 48067 248-542-7866/www.gtao.com		FORBES INCORPORATED					

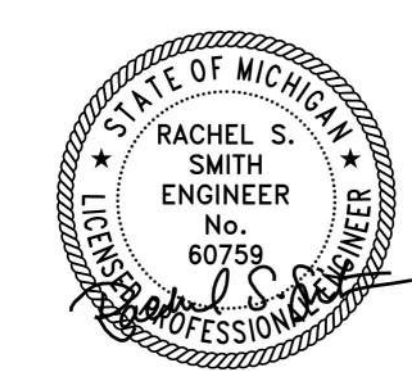
GENERAL FOUNDATION PLAN NOTES:

- COORDINATE ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS
- REFERENCE FINISH FLOOR ELEVATION = 100'-0".
- ALLOWABLE GROSS BEARING PRESSURE = 3000 PSF. REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL DETAILS AND RECOMMENDATIONS.
- ELEVATIONS OF EXISTING FOOTINGS NOTED ARE BASED ON EXISTING DESIGN DRAWINGS AND SHOULD NOT BE CONSIDERED AS-BUILT. CONTRACTOR TO FIELD VERIFY ALL ELEVATIONS OF EXISTING FOOTINGS AND ADJUST AS NEEDED TO MATCH NEW FOOTING WITH EXISTING FOOTINGS. STEP FOUNDATION AS REQUIRED AND SHOWN IN TYPICAL DETAIL.



ABBREVIATIONS

A.F.F. = ABOVE FINISH FLOOR
B/ = BOTTOM OF...
c/c = CENTER TO CENTER
DIAM. or Ø = DIAMETER
E.J. = EXPANSION JOINT
EL. or ELEV. = ELEVATION
FS = FAR SIDE
F.V. = FIELD VERIFY
Ga = GAGE
HS = HIGH STRENGTH
LLH = LONG LEG HORIZONTAL
LLV = LONG LEG VERTICAL
NS = NEAR SIDE
NTS = NOT TO SCALE
T/ = TOP OF...
U.N.O. = UNLESS NOTED OTHERWISE

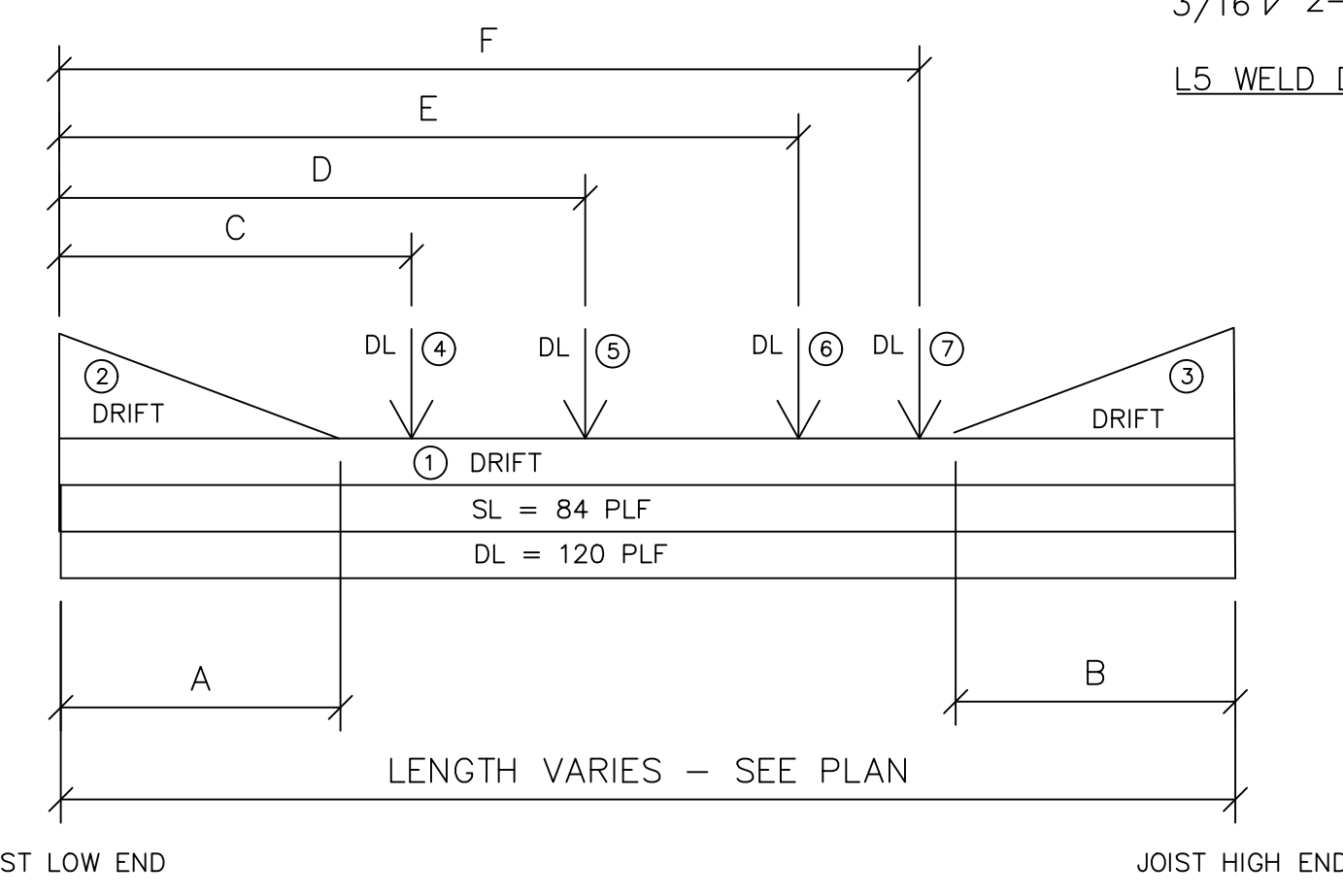
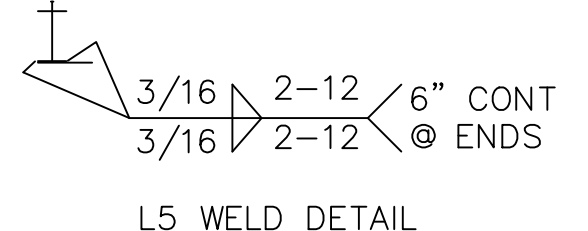


GENERAL NOTES:

- COORDINATE ROOFTOP MECHANICAL UNIT LOCATIONS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
- ALL NEW ROOFTOP UNITS ON NEW ADDITION JOISTS TO BE SUPPORTED ON ROOF CURBS. SEE TYPICAL DETAILS SHEET S-204.
- STRUCTURAL FRAMING IS DESIGNED FOR THE ALLOWABLE LOADS DUE TO MECHANICAL AND ELECTRICAL SUSPENDED UTILITIES AS LISTED BELOW:
 - TYPICAL ROOFS 10 PSF
 - CONCENTRATED LOADS LIMITED TO THOSE THAT INDUCE MOMENTS AND SHEARS LESS THAN THOSE INDUCED BY THE STATED UNIFORMLY DISTRIBUTED LOADS.
- DO NOT HANG MECHANICAL OR ELECTRICAL LOADS FROM ROOF DECK.
- PIPES OF 3" DIAMETER OR GREATER SHALL BE SUSPENDED FROM STEEL MEMBERS, USING PIPE HANGERS AND CLAMPS. HANGERS AND CLAMPS SHALL BE ALIGNED WITH STRUCTURAL BEAM CENTERLINES.
- MECHANICAL AND ELECTRICAL EQUIPMENT WEIGHTS ASSUMED FOR STRUCTURAL DESIGN ARE SHOWN ON THE MECHANICAL PLANS. IF THE EQUIPMENT WEIGHT VARIES FROM THAT LISTED, CONSULT WITH THE ARCHITECT/ENGINEER PRIOR TO STEEL SHOP DRAWING SUBMITTAL.
- THE DIMENSIONS OF THE NEW ROOF TOP UNITS ARE NOMINAL. COORDINATE CURBS AND SUPPORT FRAME SIZES WITH MECHANICAL CONTRACTOR.
- INTERMEDIATE SUPPORT POSTS FOR HEADER AROUND 8' WINDOW SECTION SHALL HAVE 7.5"x10"x3/4" BASE PLATE WITH (4) 1/2"x6" STUDS CAST IN WITH 3/16" WELD ALL AROUND TO HEADER

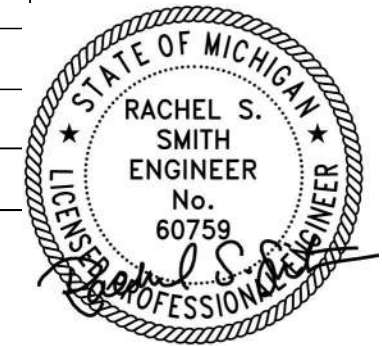
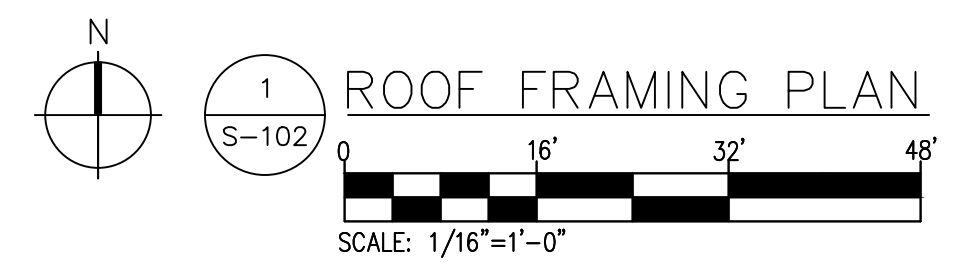
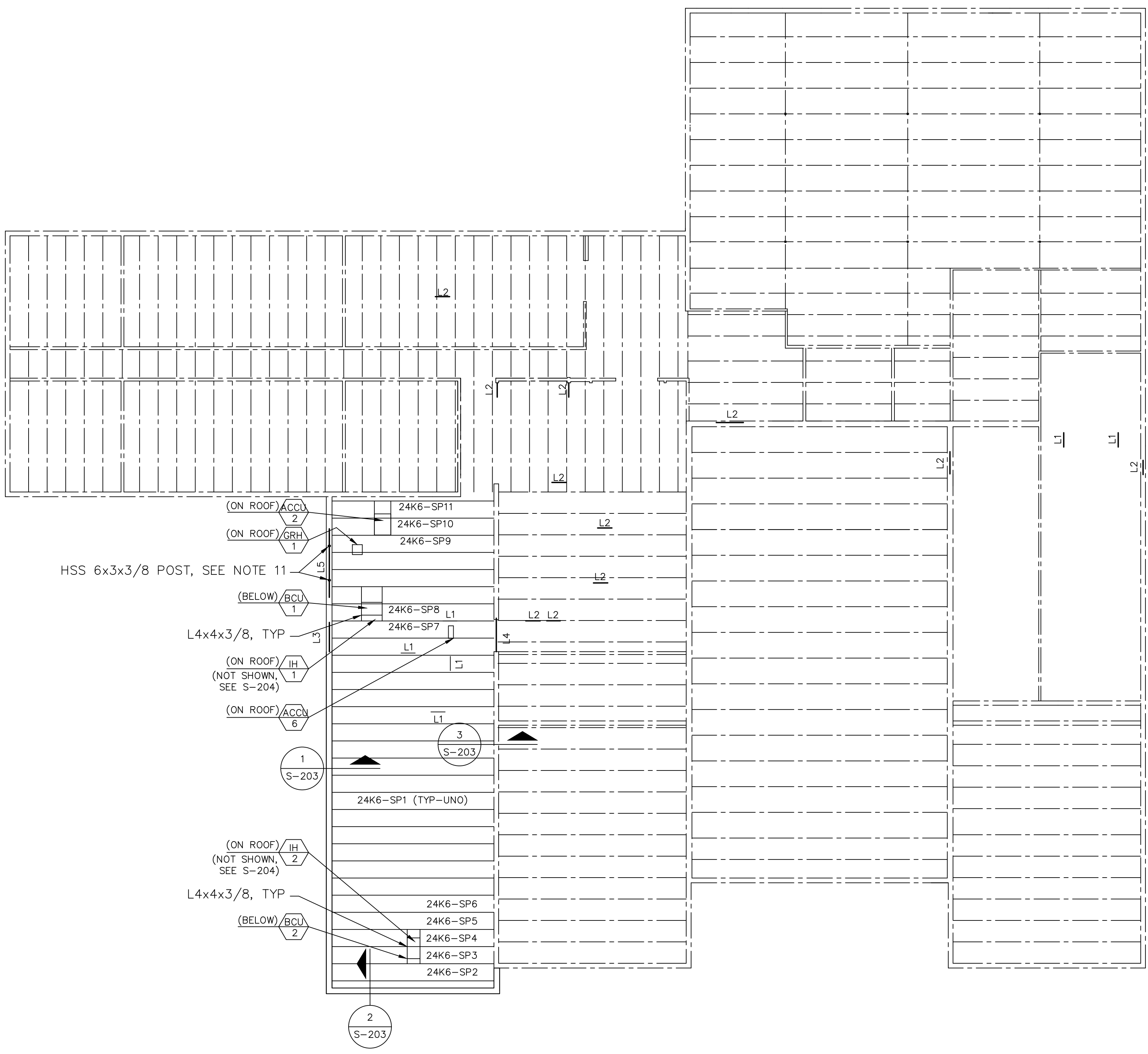
LINTEL SCHEDULE					
MARK	TYPE	SIZE	MAX OPENING	BEARING CONDITION	NOTES
L1		8" CMU BOND BEAM W/ (2) #6 CONT.	3'-6"	MIN 8" BEARING. GROUT SOLID BELOW BEARING, 1'-4" WIDE x 2 COURSES MIN	NEW LINTEL IN NEW 8" CMU WALL, INTERIOR, BEARING & NON-BEARING
L2		(2) L5x3 1/2 x 5/16 LLV	3'-6"	MIN 8" BEARING. GROUT SOLID BELOW BEARING, 1'-4" WIDE x 2 COURSES MIN	NEW LINTEL IN EXISTING 8" CMU WALL, WITH ROOF BEARING
L3		8" CMU BOND BEAM W/ (2) #6 CONT. & L7x4x3/8 LLO	3'-6"	MIN 8" BEARING. GROUT SOLID BELOW BEARING, 1'-4" WIDE x 2 COURSES MIN	NEW LINTEL IN NEW 1'-4" BRICK & BLOCK WALL, WITH & WITHOUT ROOF BEARING
L4		W10x33 W/ 1/2" DIAMETER x 8" STUDS @ 32" OC TOP FLANGE & L5x3 1/2 x 3/8 LLV	8'-0"	MIN 16" BEARING. GROUT SOLID BELOW BRG, 2'-8" WIDE x 3 COURSES MIN	NEW LINTEL IN EXISTING 12" BRICK & BLOCK WALL, WITH ROOF BEARING
L5		W10x33 W/ 1/2" DIAMETER x 6" STUDS @ 32" OC TOP FLANGE & 3/8" x 16" PLATE AT BOT FLANGE WELD PER DETAIL	8'-0"	MIN 16" BEARING. GROUT SOLID BELOW BRG, 2'-8" WIDE x 3 COURSES MIN	NEW LINTEL OVER 8' WINDOW IN NEW WALL, WITH ROOF BEARING. 16" WINDOW HAS 2 INTERMEDIATE TUBE STEEL COLUMNS

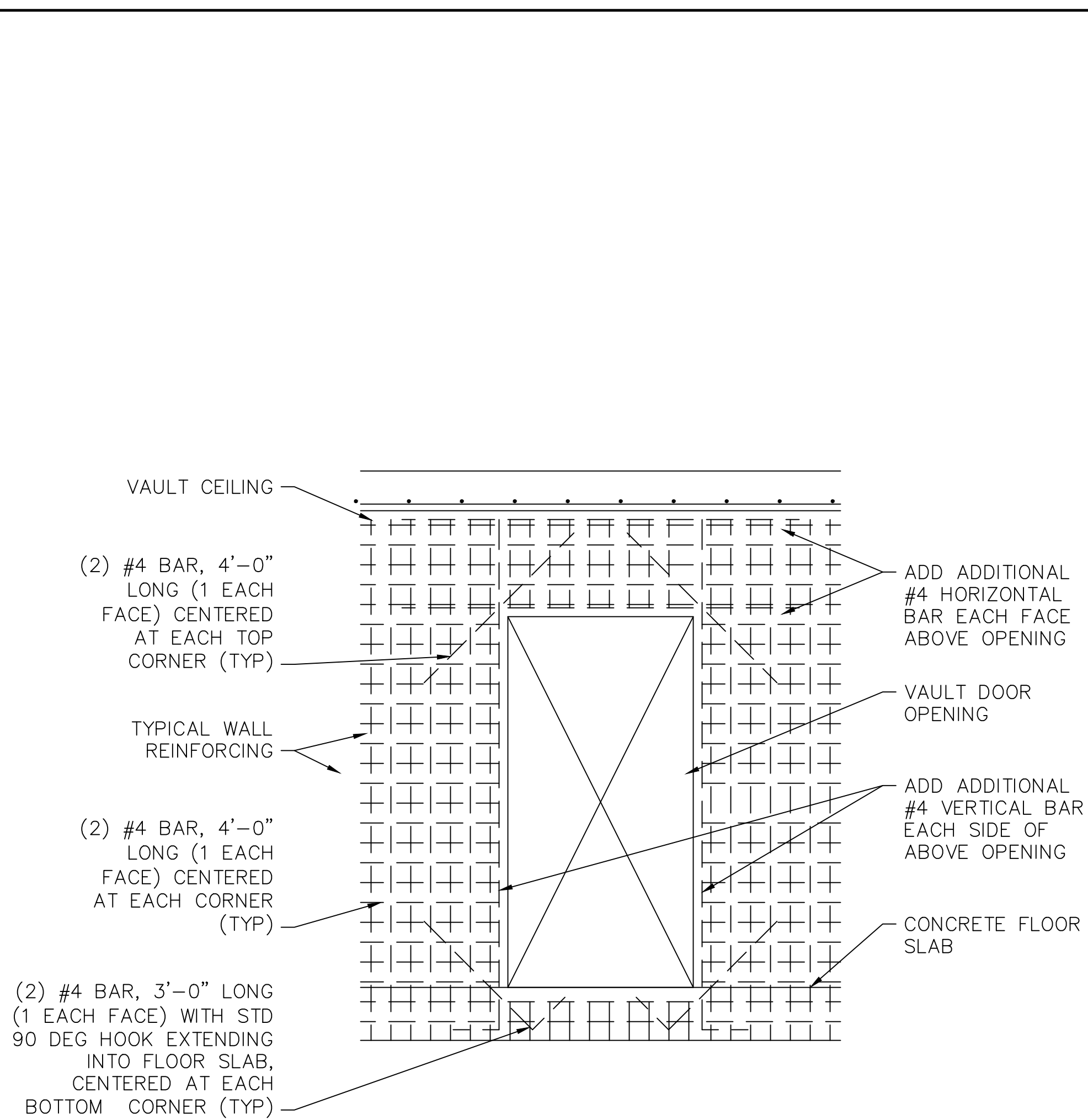
- NOTE:
- BOND BEAM LINTELS SHALL HAVE 1.5" COVER TO REINFORCING STEEL
 - ALL LINTELS IN EXTERIOR WALLS SHALL BE GALVANIZED
 - STEEL LINTELS BEARING ON CMU SHALL HAVE (2) 1/2" DIAMETER x 6" STUDS AT 3/8" BEARING PLATE CAST-IN



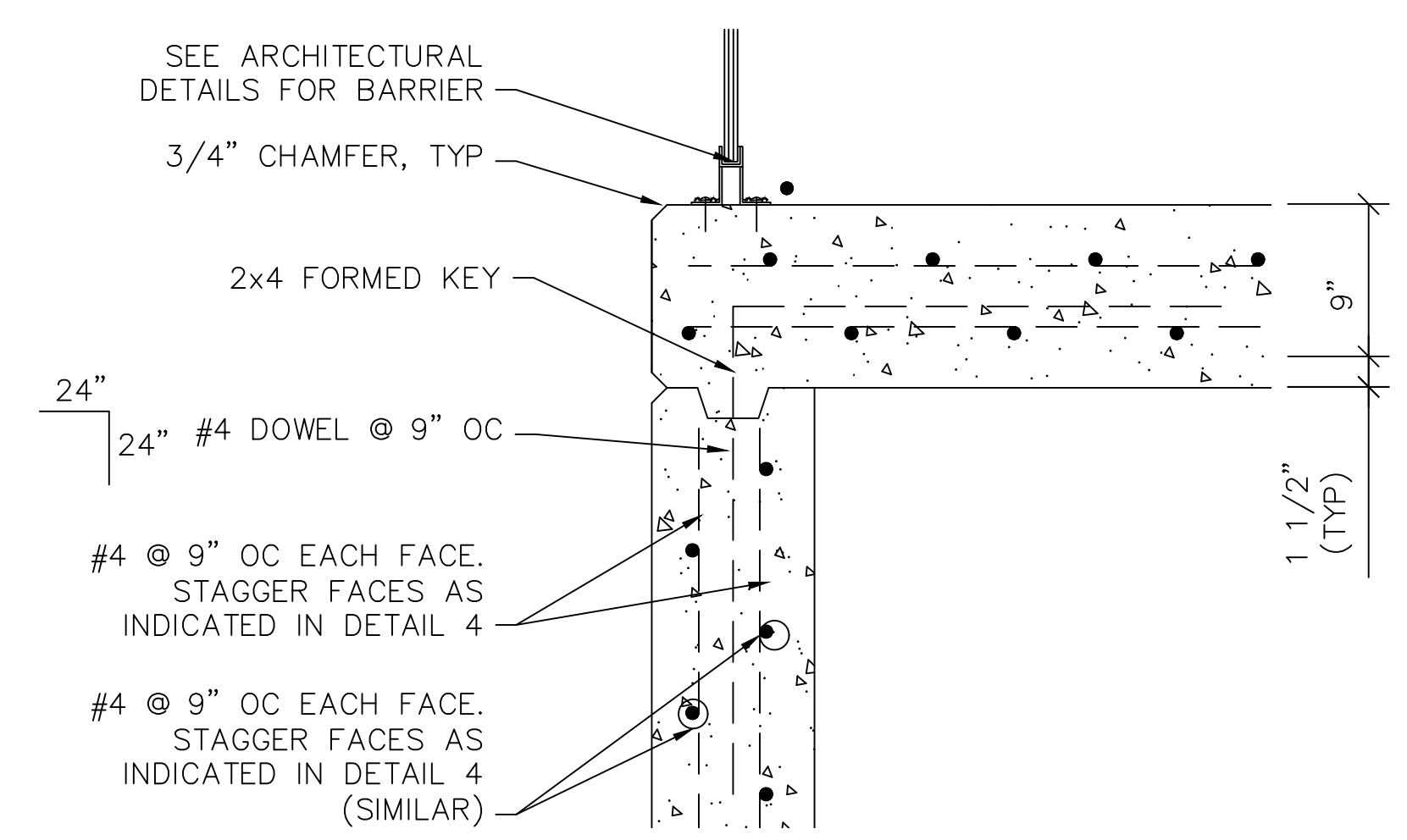
SPECIAL JOIST LOADING SCHEDULE										
MARK	1 (PLF)	2 (PLF)	3 (FT-IN)	4 (FT-IN)	5 (LB)	6 (LB)	7 (LB)	8 (FT-IN)	9 (FT-IN)	10 (FT-IN)
24K6-SP1		108	7'-3"							
24K6-SP2	70	38	2'-7"							
24K6-SP3	79	29	1'-11"							
24K6-SP4	60	48	3'-3"		100	100		17'-7"	20'-7"	
24K6-SP5	40	68	4'-7"							
24K6-SP6	20	88	5'-11"							
24K6-SP7	108		7'-3"		100	100		6'-11"	11'-9"	
24K6-SP8	108		7'-3"		147	147		6'-11"	11'-9"	
24K6-SP9	108		7'-3"		138	138		9'-11"	13'-9"	
24K6-SP10	108		7'-3"		198	198		9'-11"	13'-9"	
24K6-SP11	81		7'-3"							

- NOTE:
- ALL JOISTS TO BE DESIGNED FOR 100 LB POINT LOAD (DEAD) AT ANY ONE PANEL POINT. ANY POINT LOAD < 100 LB NOT INCLUDED IN TABLE.

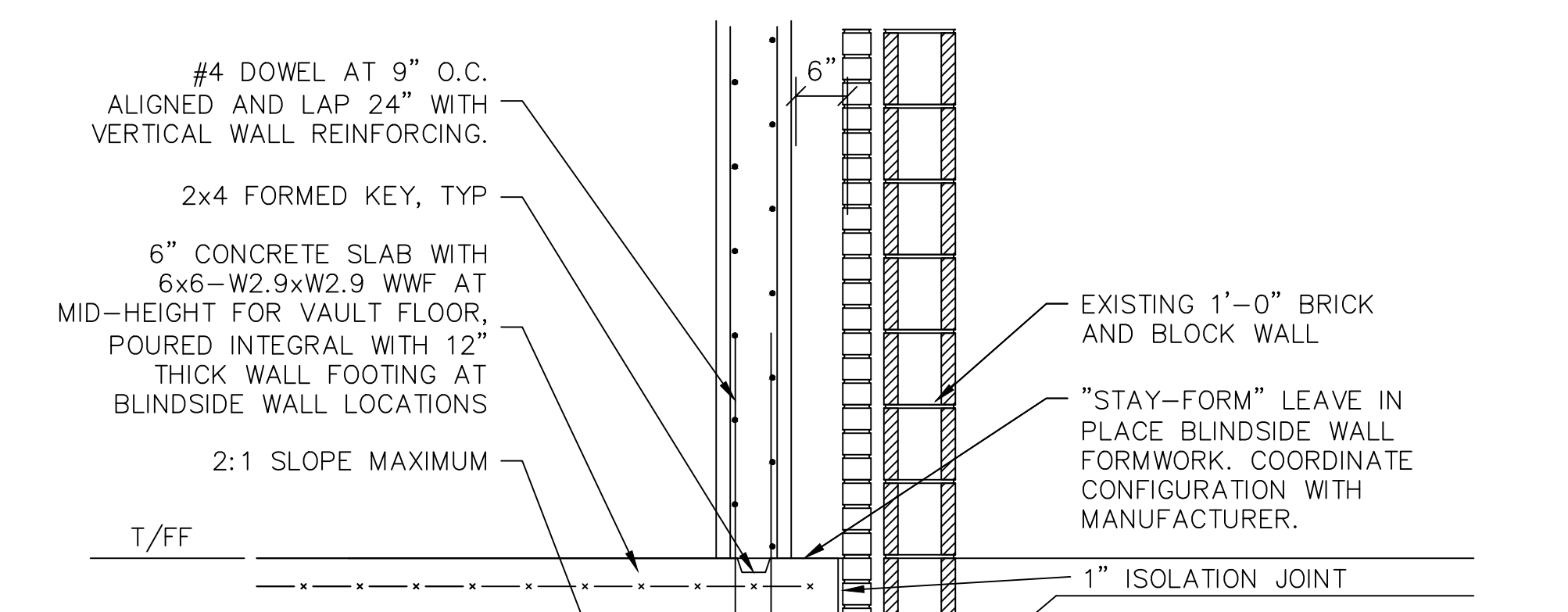
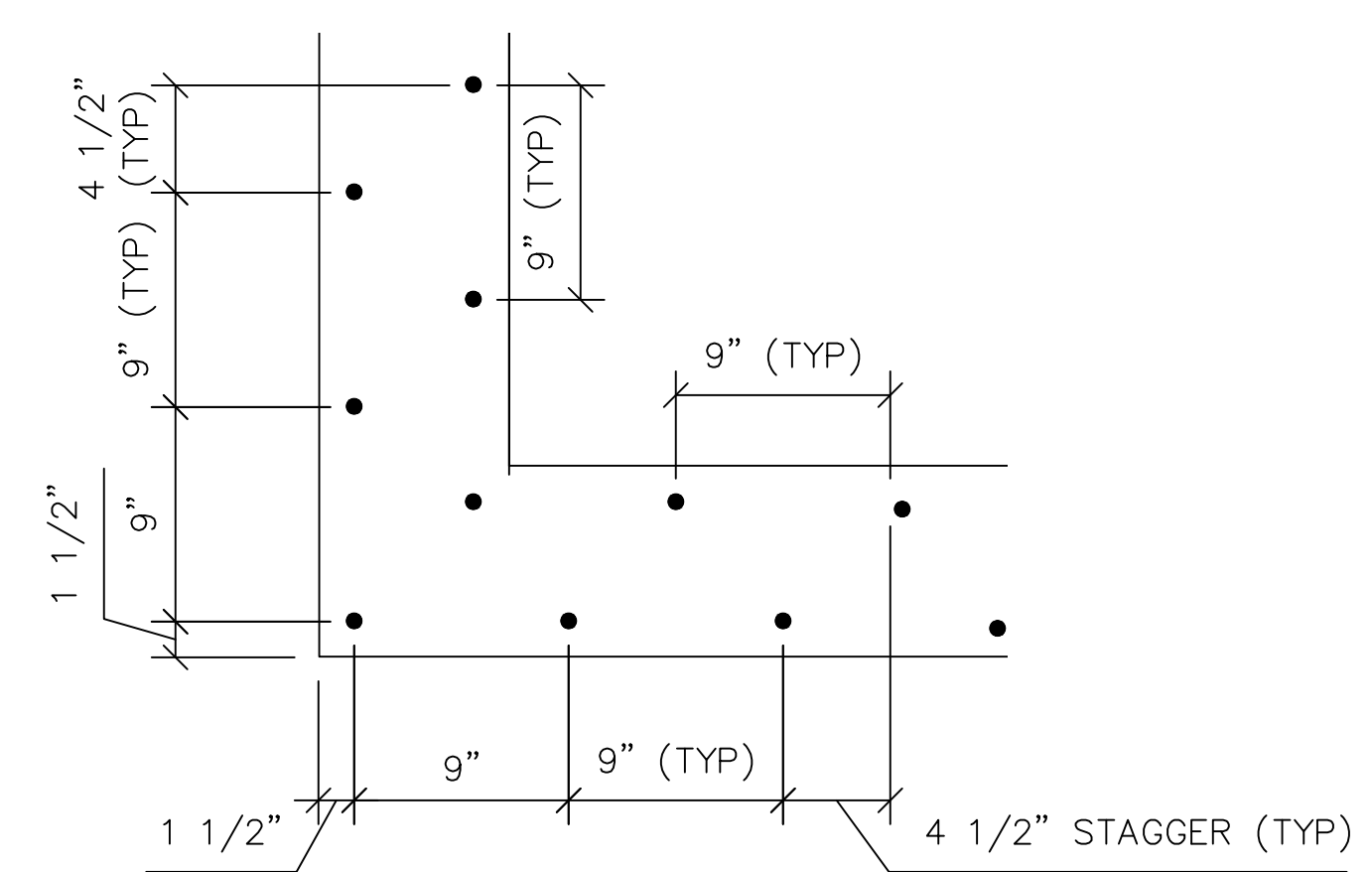




REINFORCING AT VAULT DOOR OPENING

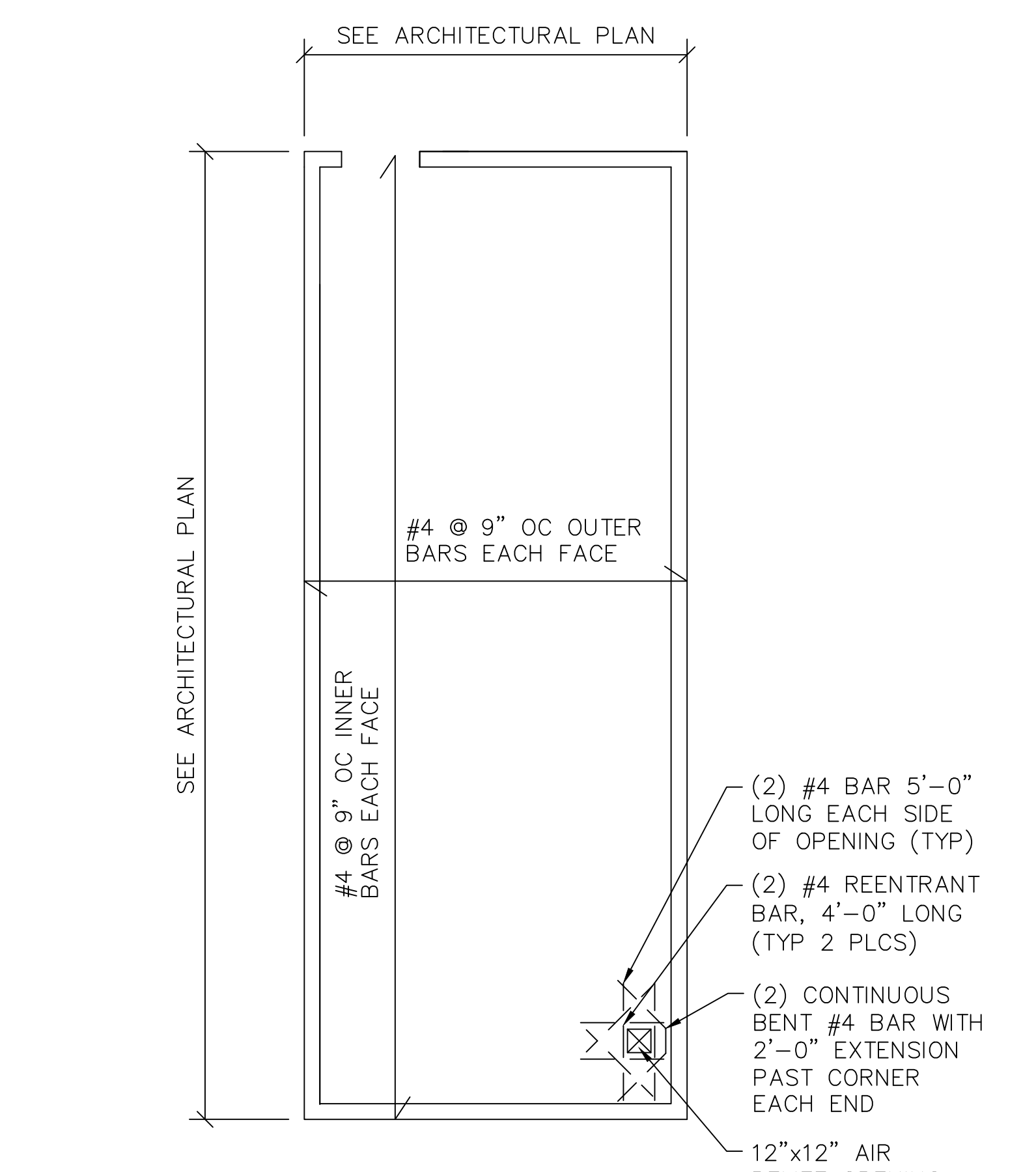


3 VAULT DETAIL SCALE: 1 1/2" = 1'-0"

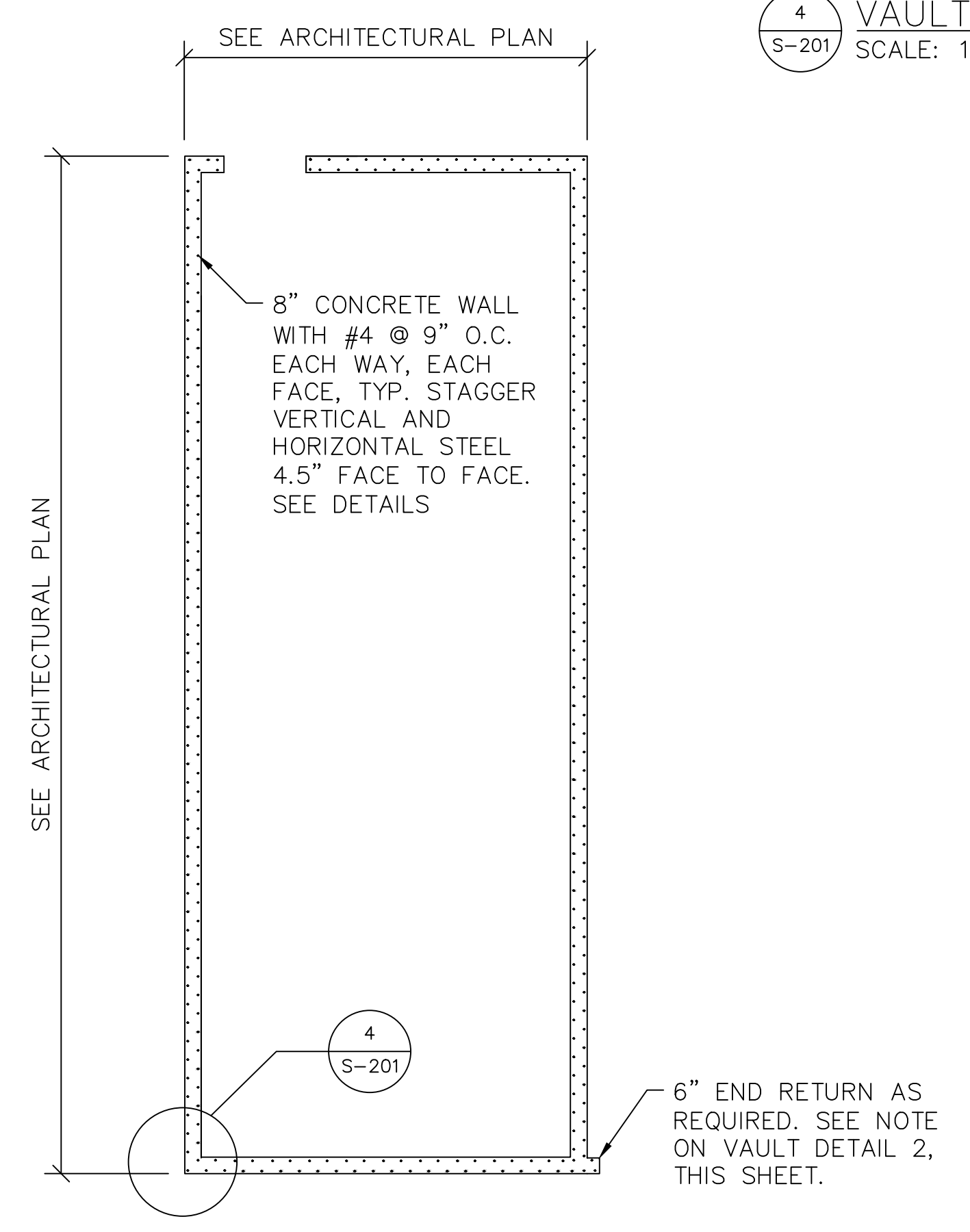


2 VAULT DETAIL SCALE: 3/4" = 1'-0"

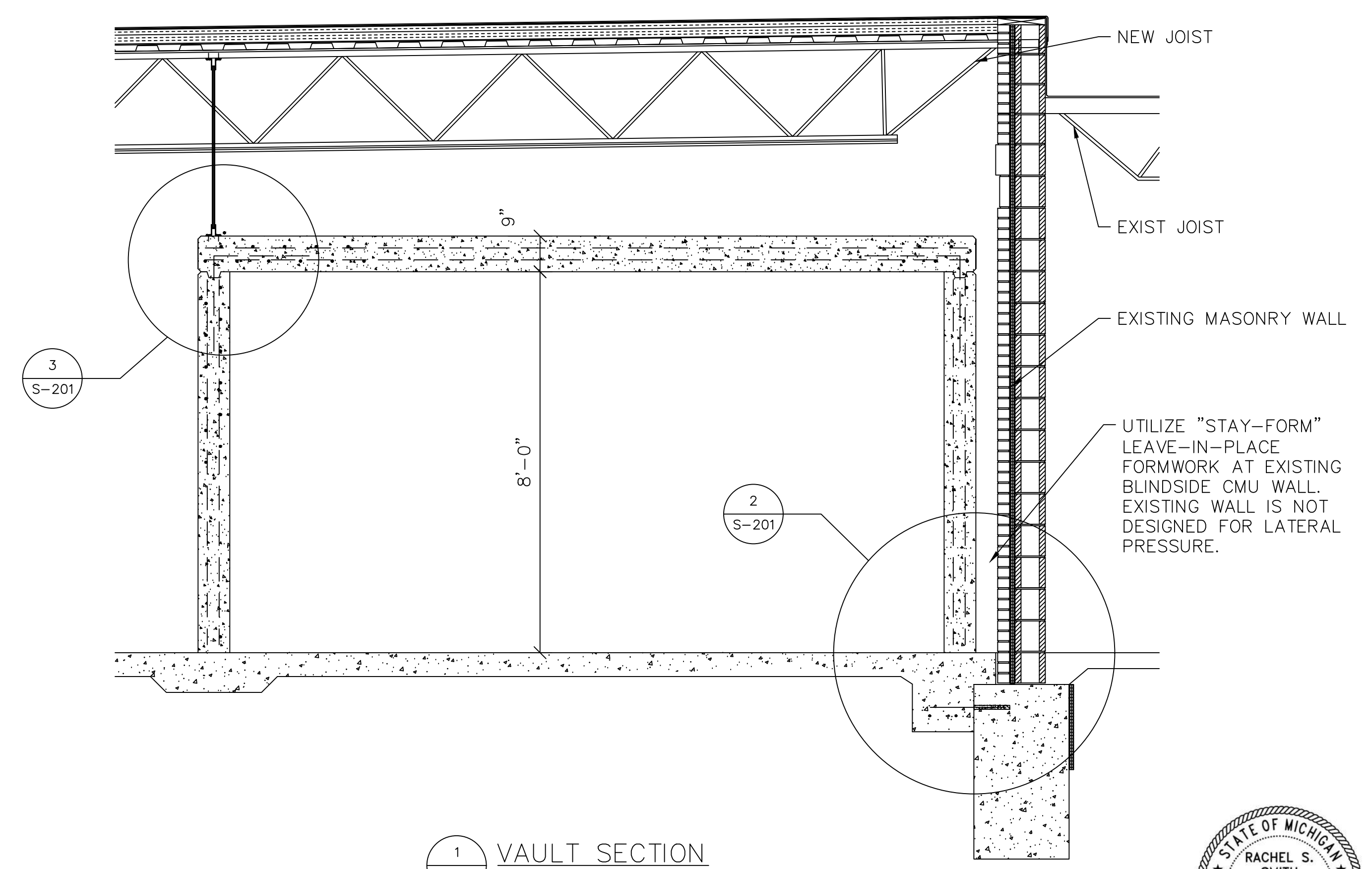
NOTE: UPON EXCAVATION IF IT IS DETERMINED THAT EXISTING FOOTING IS NOT A TRENCH FOOTING AS SHOWN, VAULT WALL CAN MOVE CLOSER TO EXISTING EXTERIOR WALL, LEAVING ONLY MINIMUM SPACE REQUIRED BY STAY-FORM MANUFACTURER. 6" SPACE AS SHOWN IS REQUIRED FOR ANCHORAGE ON VAULT WALL DOWELS DUE TO GEOMETRY OF INTERFACE WITH EXISTING TRENCH FOOTING AS SHOWN IN AS-BUILTS. CONSULT ARCHITECT FOR ANY REQUESTED CHANGES



VAULT CEILING SLAB PLAN



VAULT WALL PLAN



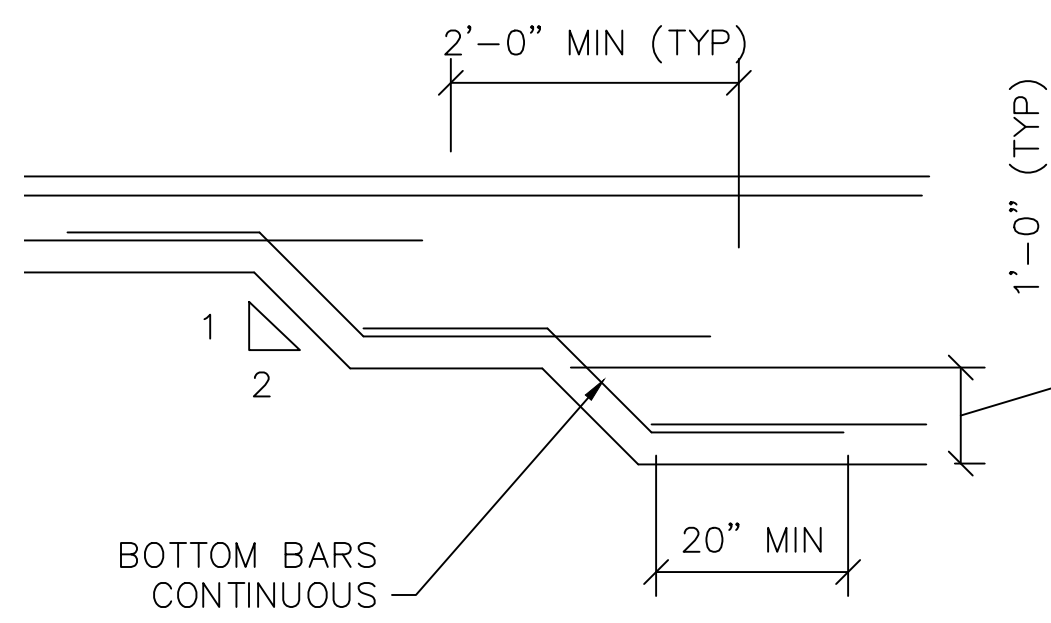
1 VAULT SECTION SCALE: 1/2" = 1'-0"



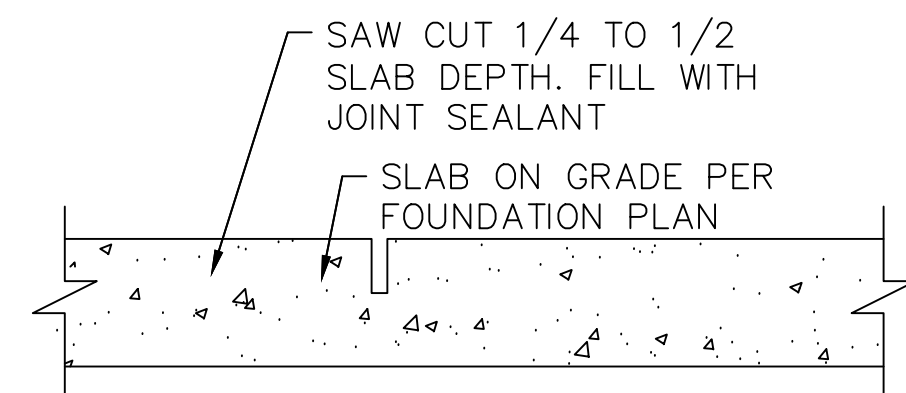
DRAWING NUMBER S-201	DRAWING TITLE CONCRETE VAULT SECTIONS & DETAILS	SHEET NUMBER 25 OF 96	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 5117/1326.CAK DWG PROJECT NO. 26C8022016	ISSUED FOR 100% CONSTRUCTION DOCUMENTS	DATE 03/09/2022	DESIGNED RS	PROJECT RENOVATE ARMORY WASHTEAW ARMORY
	DESIGNED RS	CHECKED RS	APPROVED RS	PROJECT RENOVATE ARMORY WASHTEAW ARMORY	DATE 03/09/2022	DESIGNED RS	PROJECT RENOVATE ARMORY WASHTEAW ARMORY

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
DIVISION OF CONSTRUCTION SERVICES
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

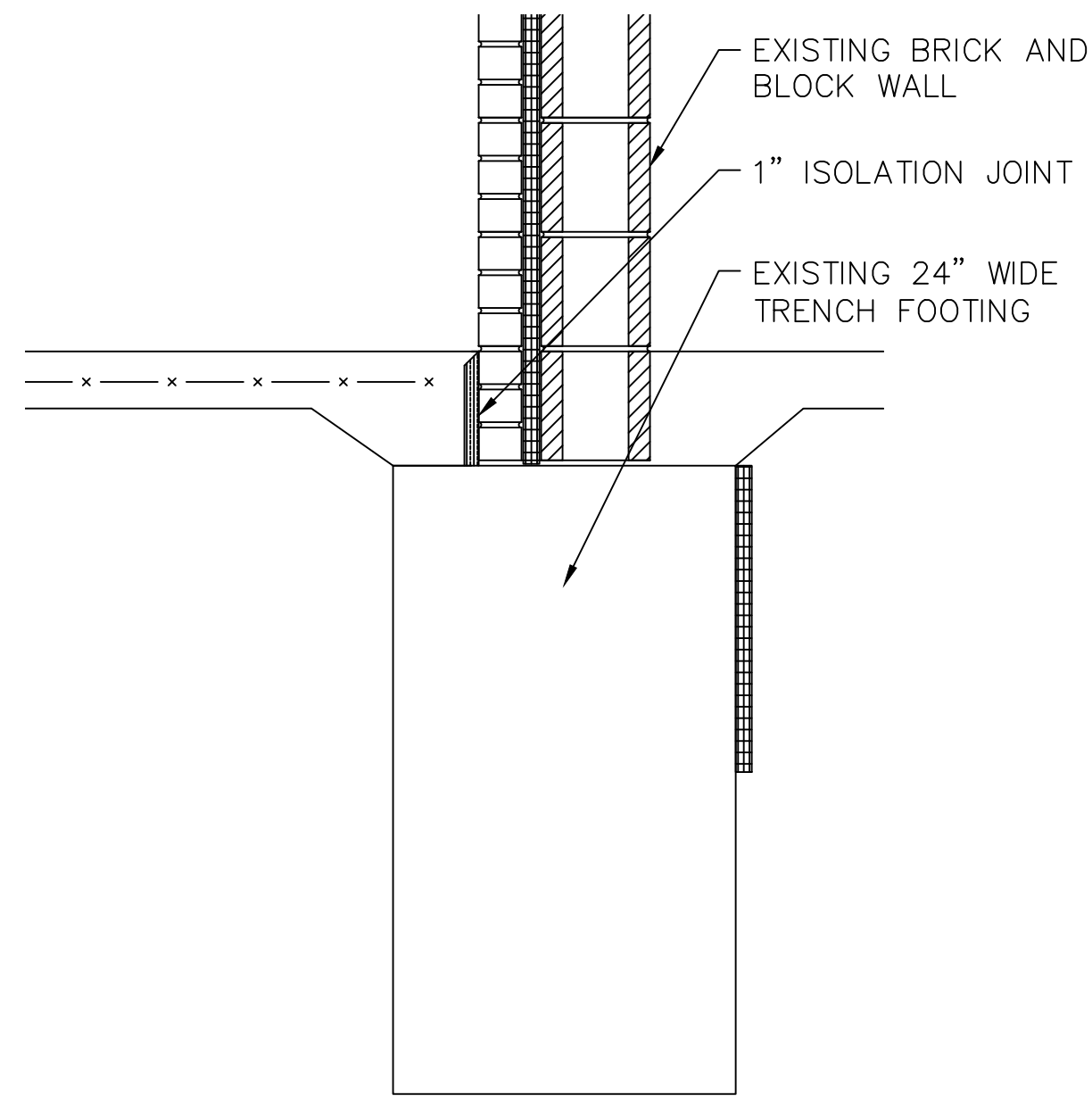
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CONSULTANTS, INC.



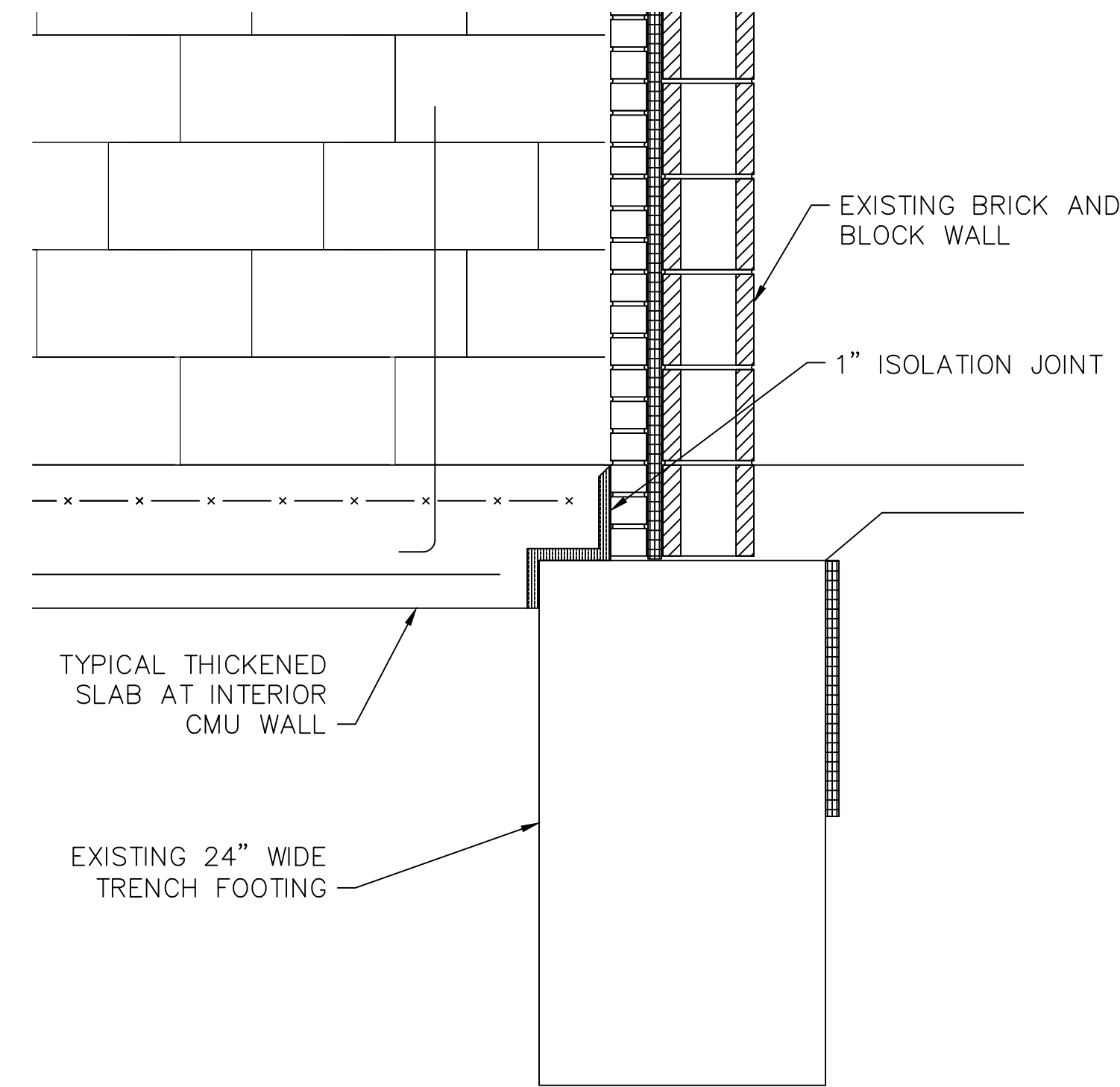
TYPICAL STEPPED FOOTING DETAIL
SCALE: 1/2" = 1'-0"



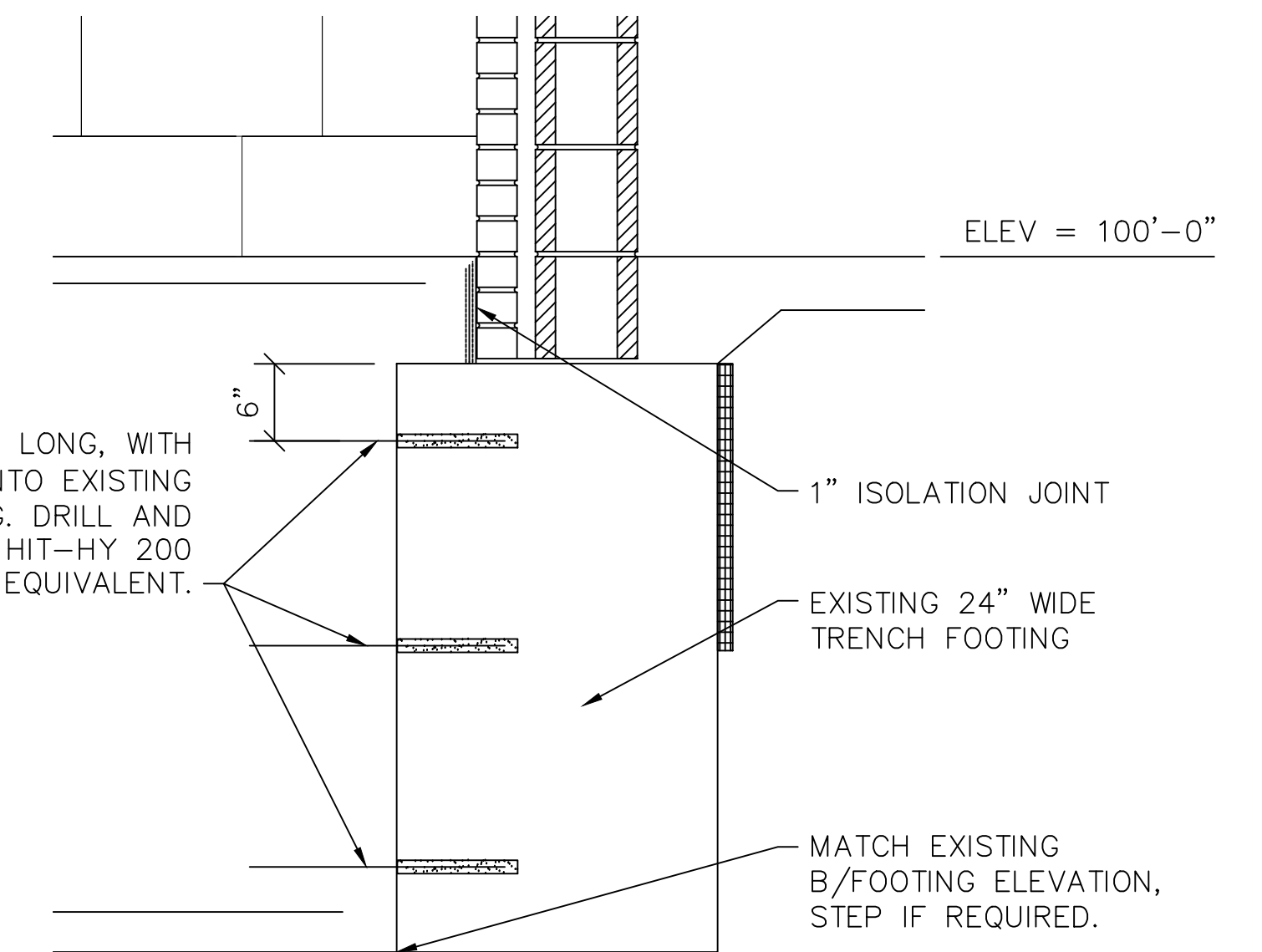
CONTROL JOINT SECTION



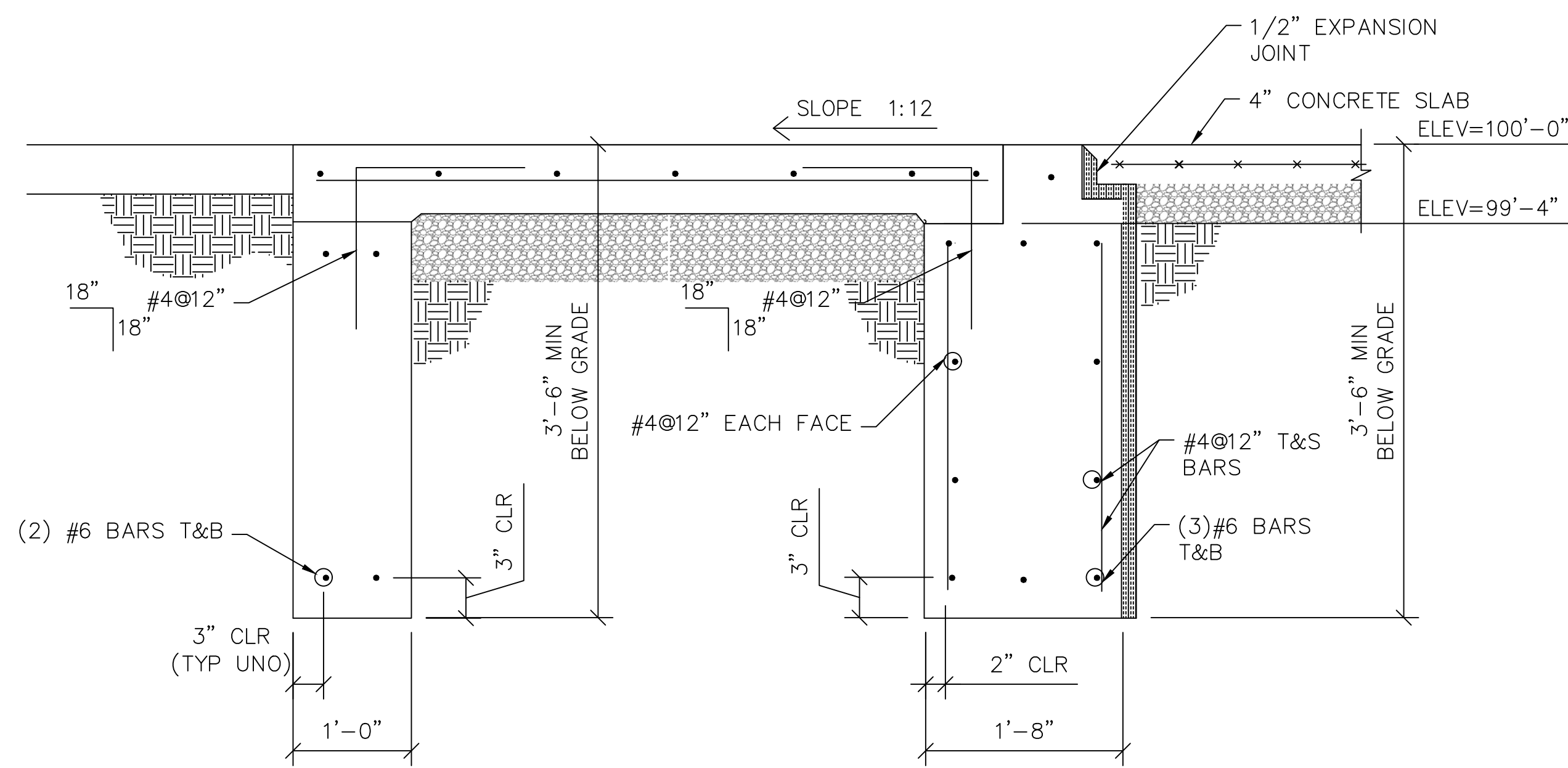
6 TYPICAL SLAB INTERFACE WITH EXISTING TRENCH FOOTING SECTION
SCALE: 1" = 1'-0"



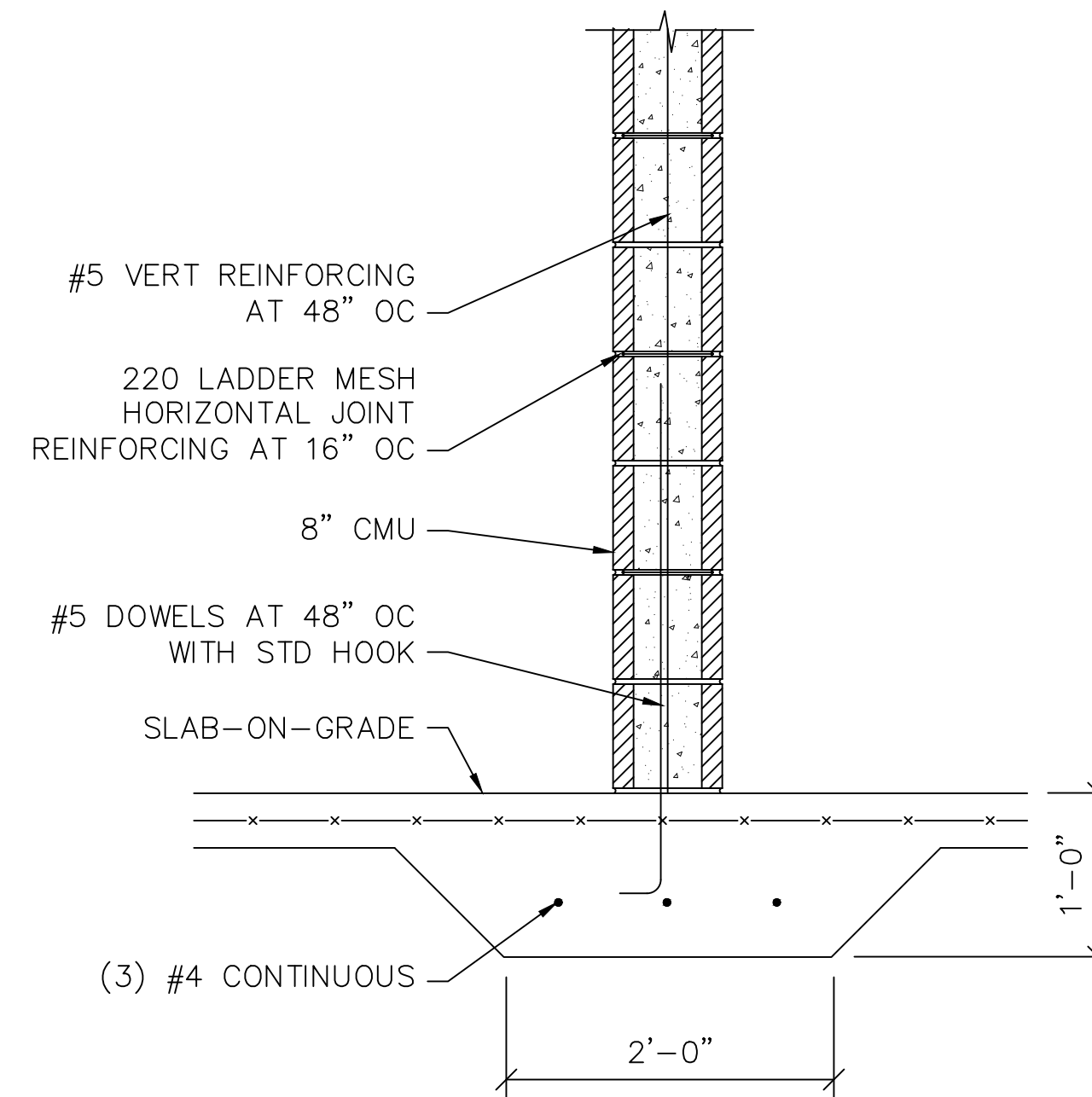
5 THICKENED SLAB INTERFACE WITH EXISTING TRENCH FOOTING SECTION
SCALE: 1" = 1'-0"



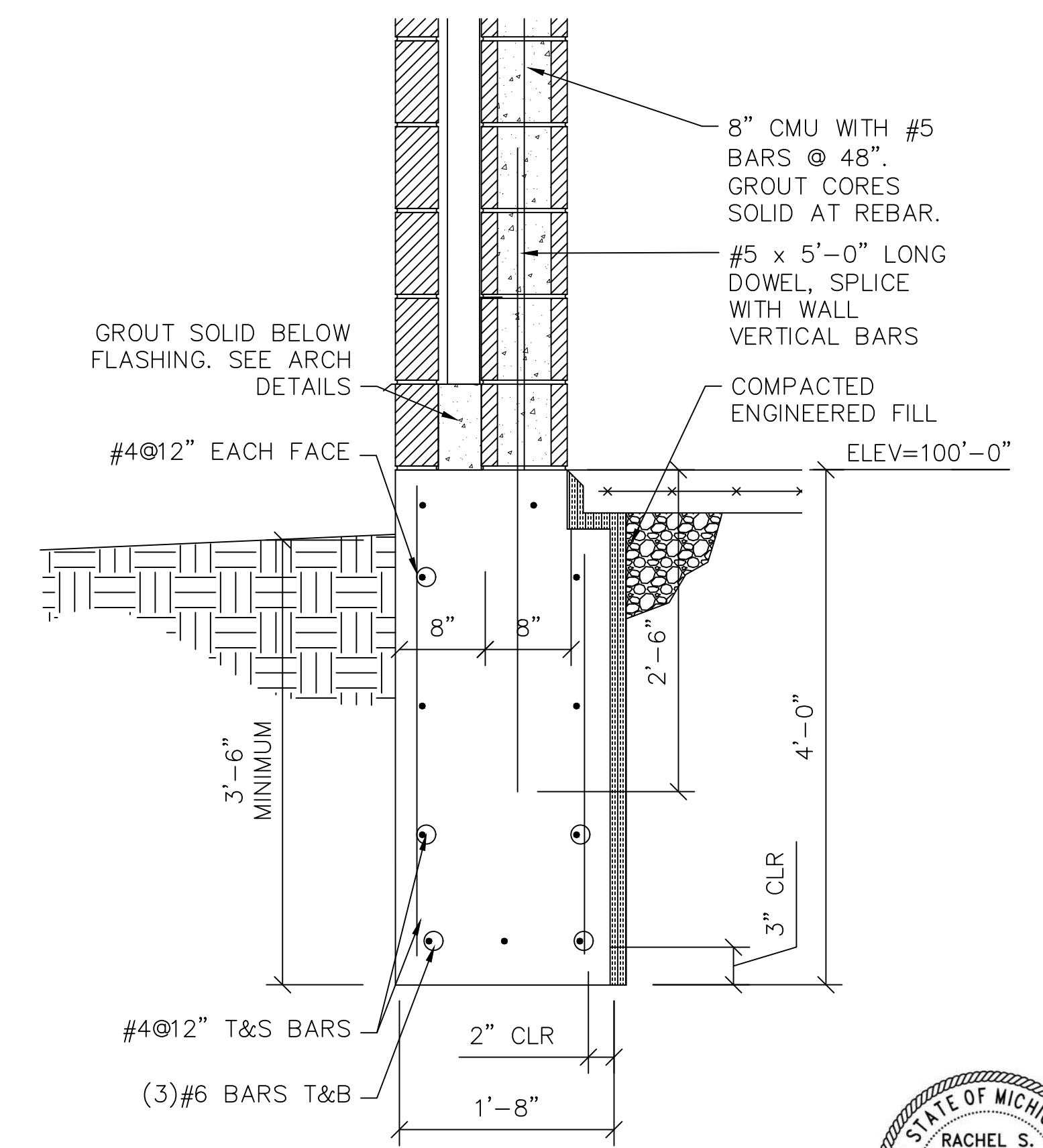
4 FOUNDATION INTERFACE SECTION
SCALE: 1" = 1'-0"



3 FOUNDATION SECTION @ DOOR
SCALE: 1" = 1'-0"

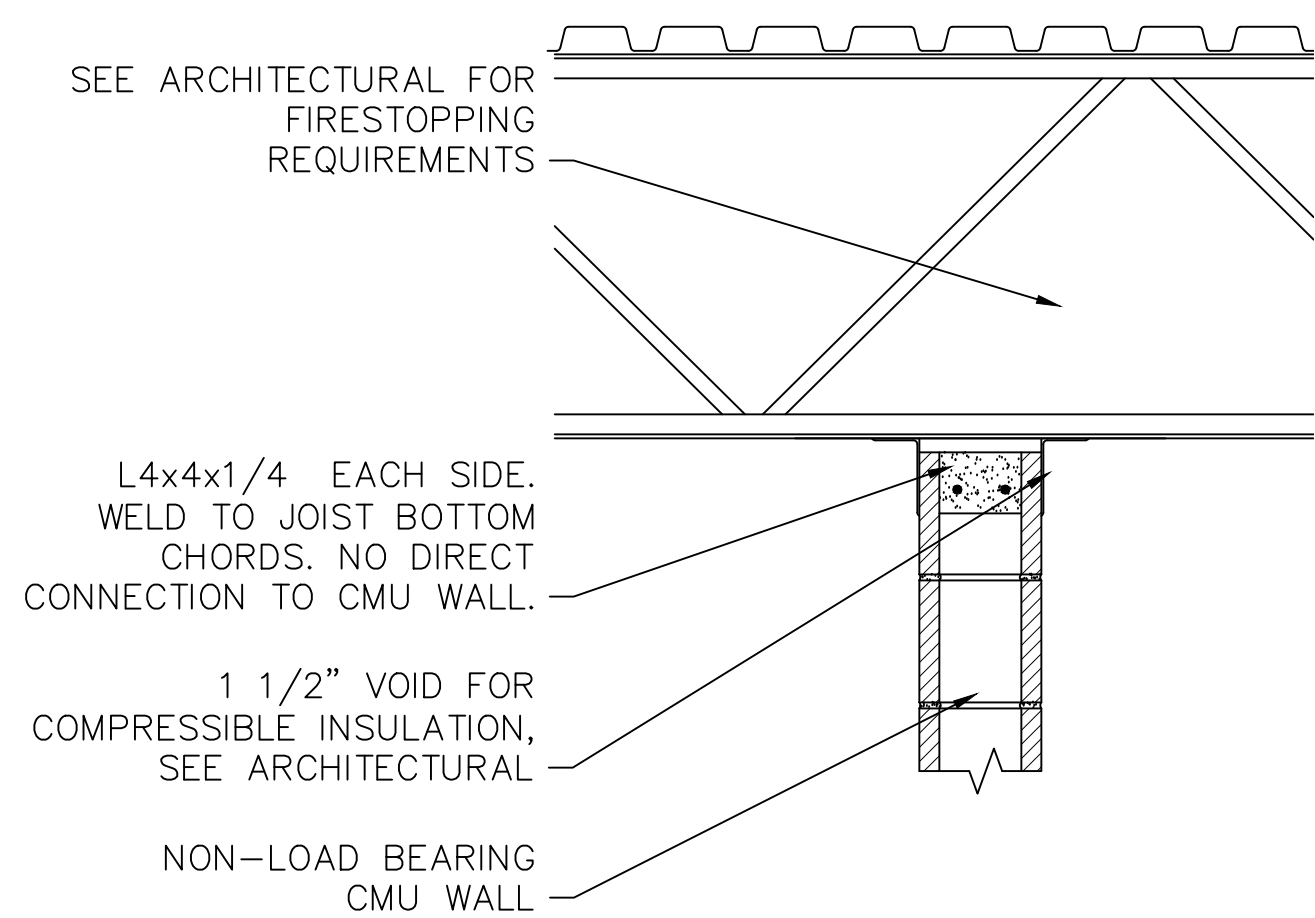


2 THICKENED SLAB AT INTERIOR CMU WALL
SCALE: 1" = 1'-0"



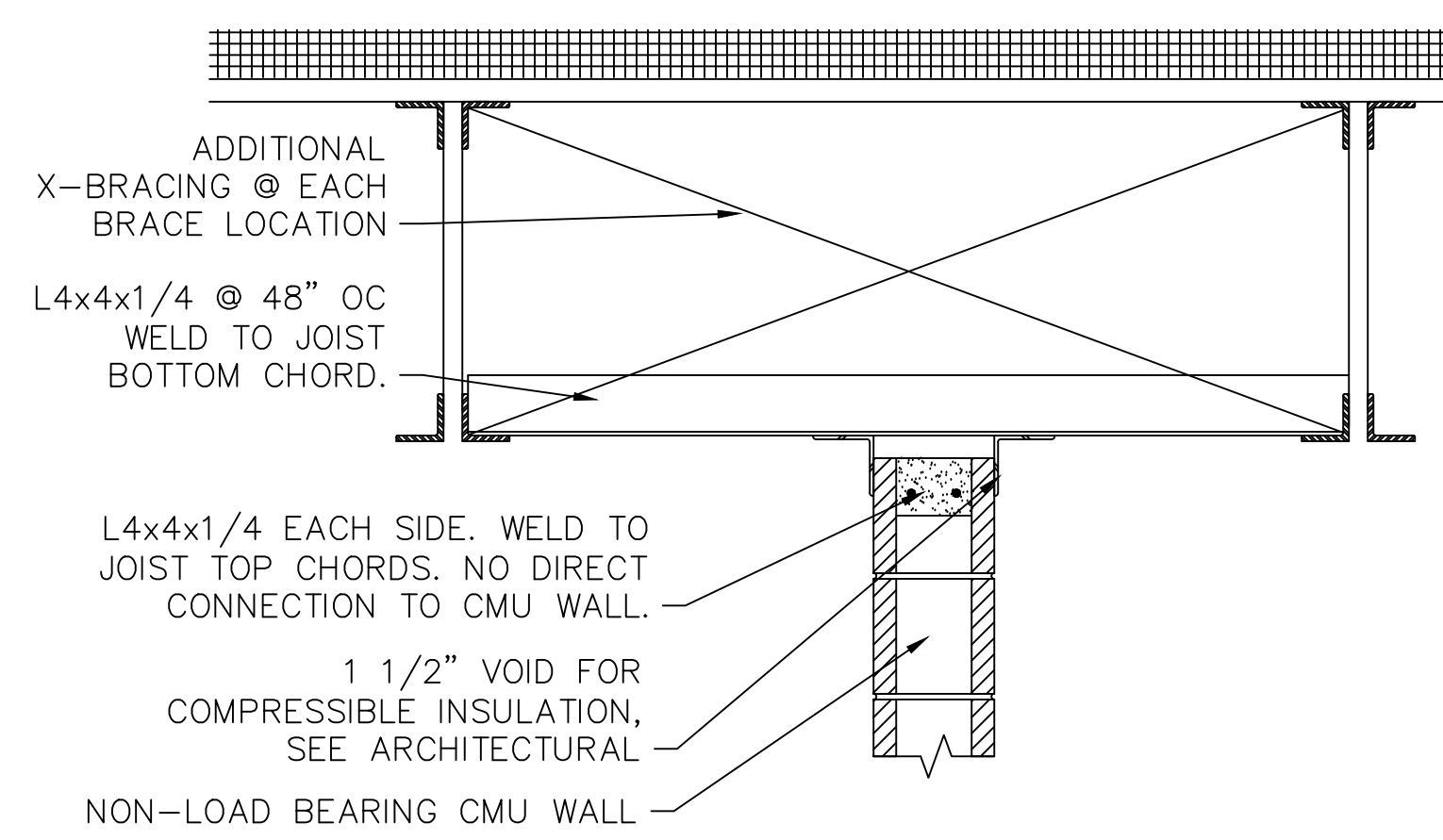
1 EXTERIOR WALL FNDN SECTION
SCALE: 1" = 1'-0"



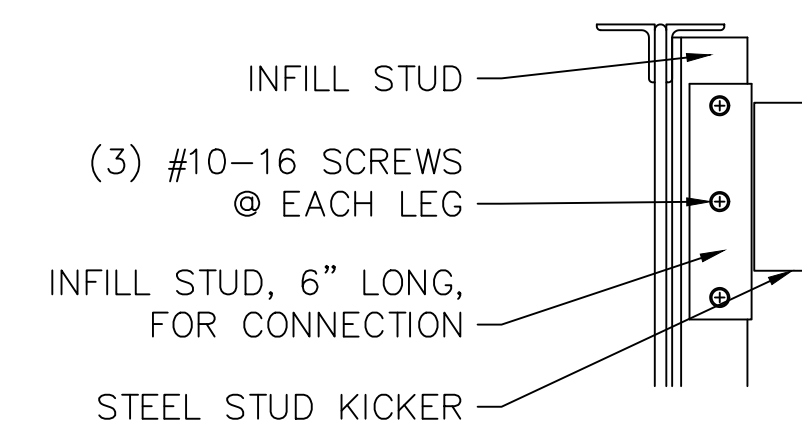


NOTE: PROVIDE THIS DETAIL AT EACH PERPENDICULAR JOIST ALONG WALL LENGTH. L4x4 TO BE 6" WIDER THAN JOIST BOTTOM CHORD WIDTH

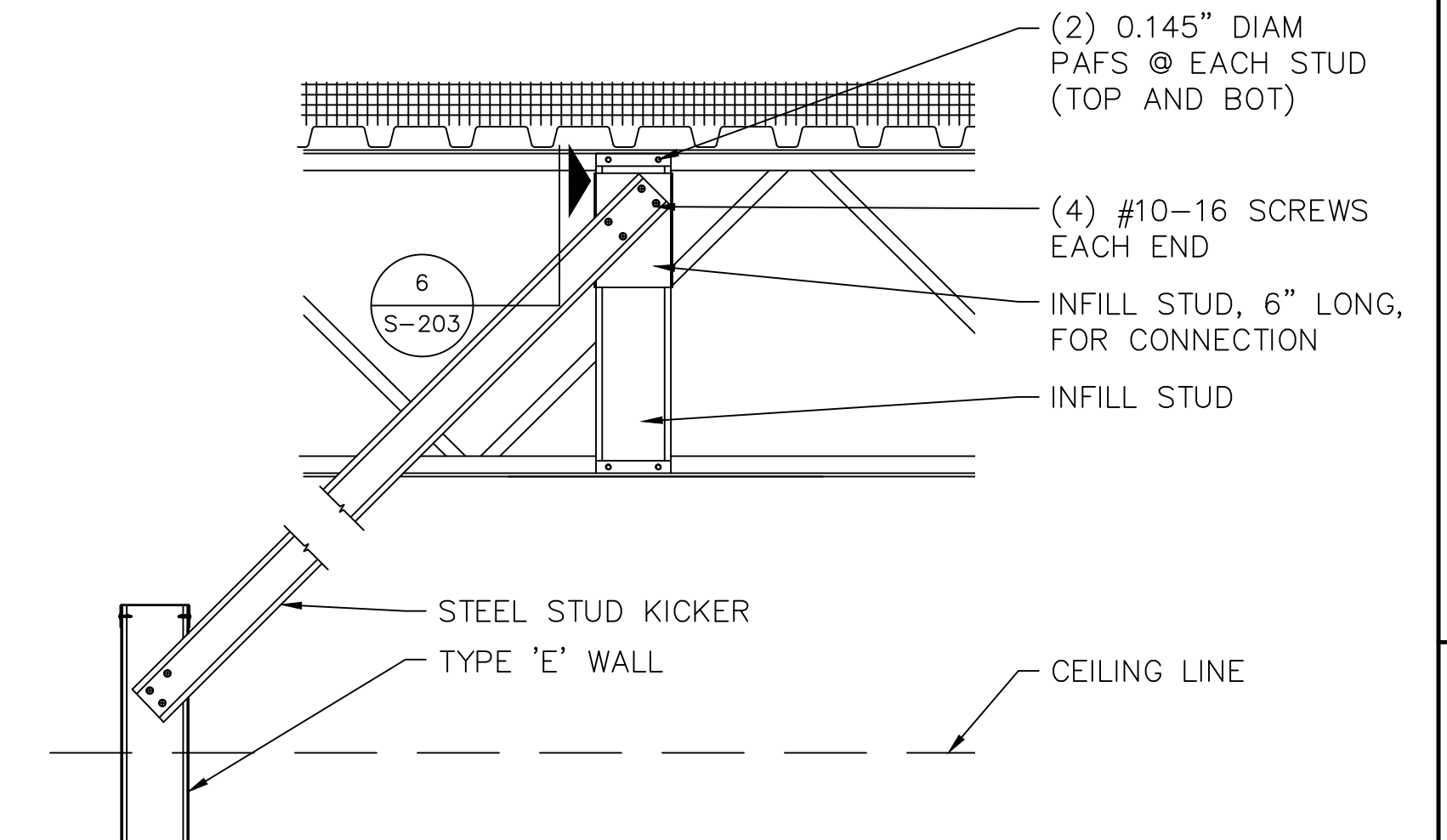
NON-LOAD BEARING TYPE 'A' WALL BRACE, JOISTS PERPENDICULAR



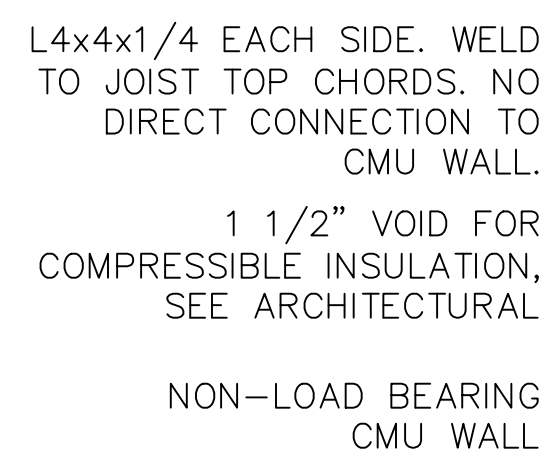
NON-LOAD BEARING TYPE 'A' WALL BRACE, JOISTS PARALLEL



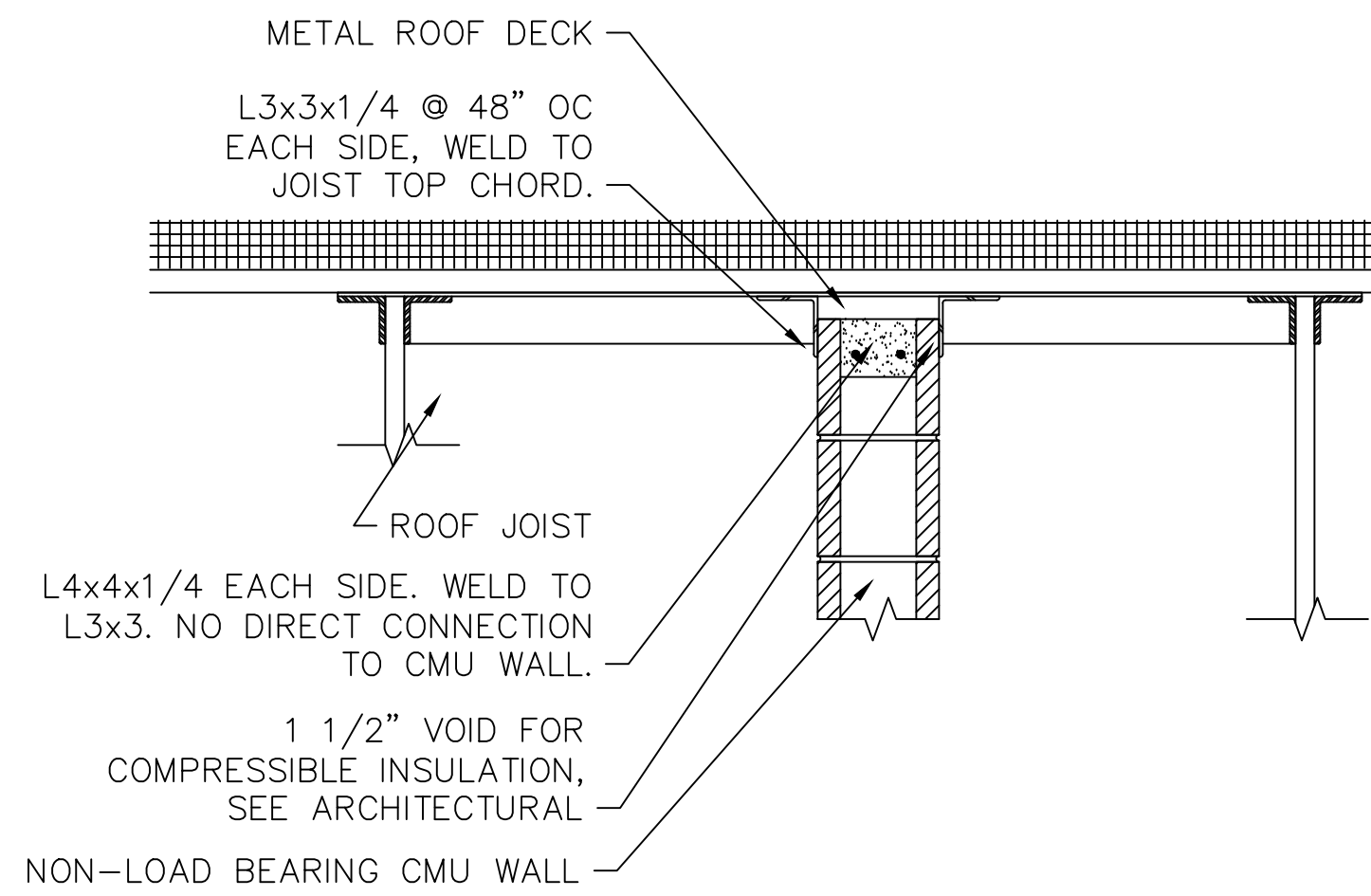
TYPE 'E' WALL BRACE SECTION SCALE: 3" = 1'-0"



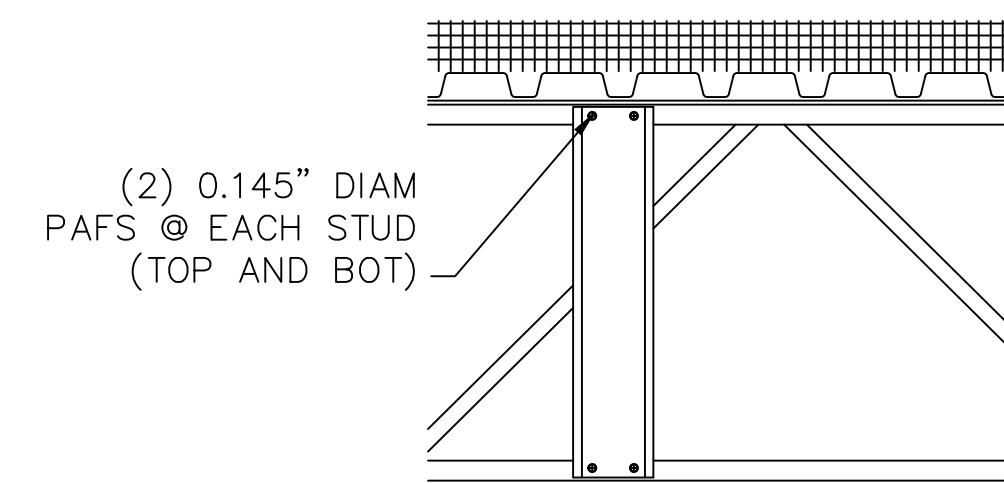
NON-LOAD BEARING TYPE 'E' WALL BRACE, JOISTS PERPENDICULAR



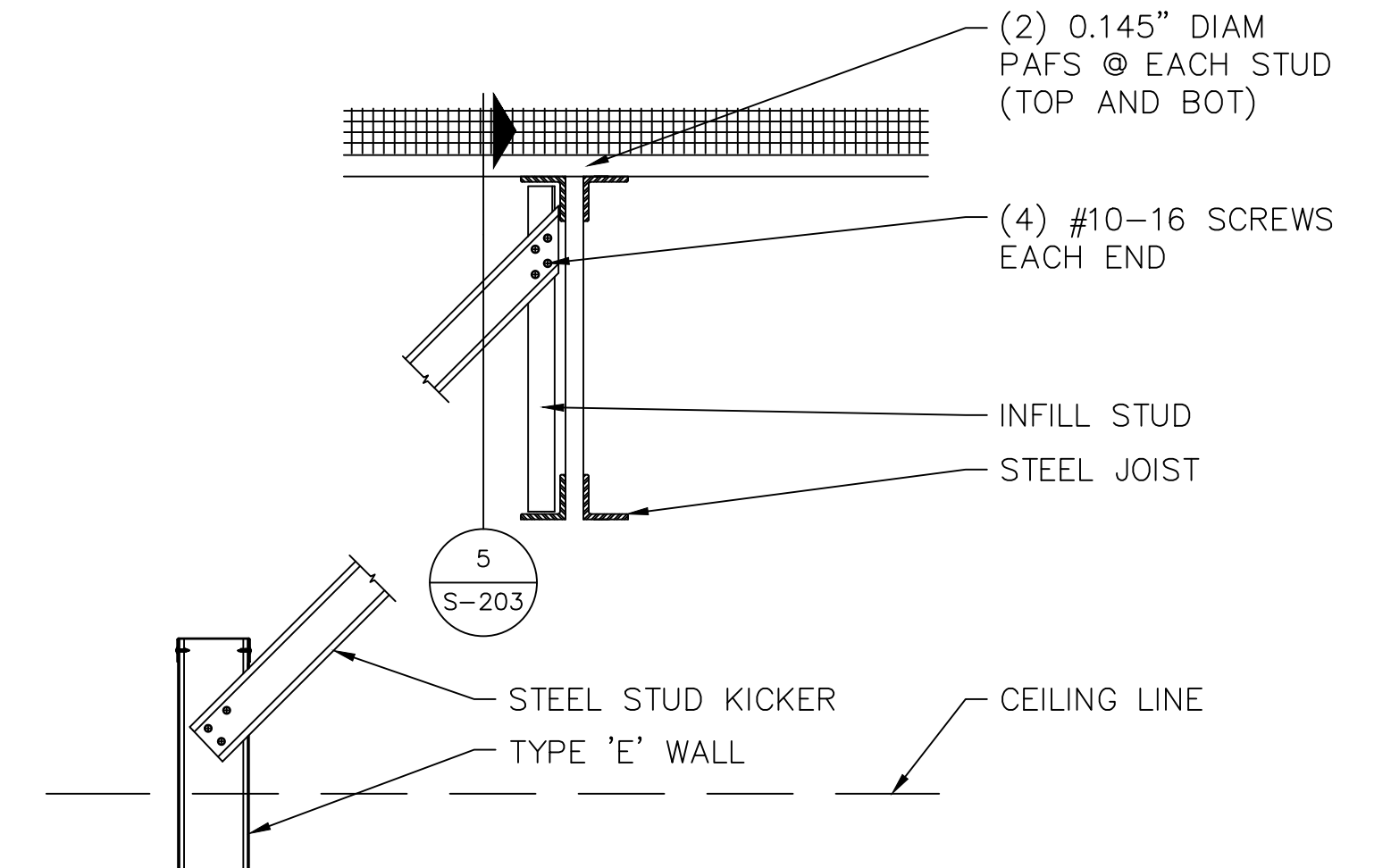
NON-LOAD BEARING TYPE 'B' WALL BRACE, JOISTS PERPENDICULAR



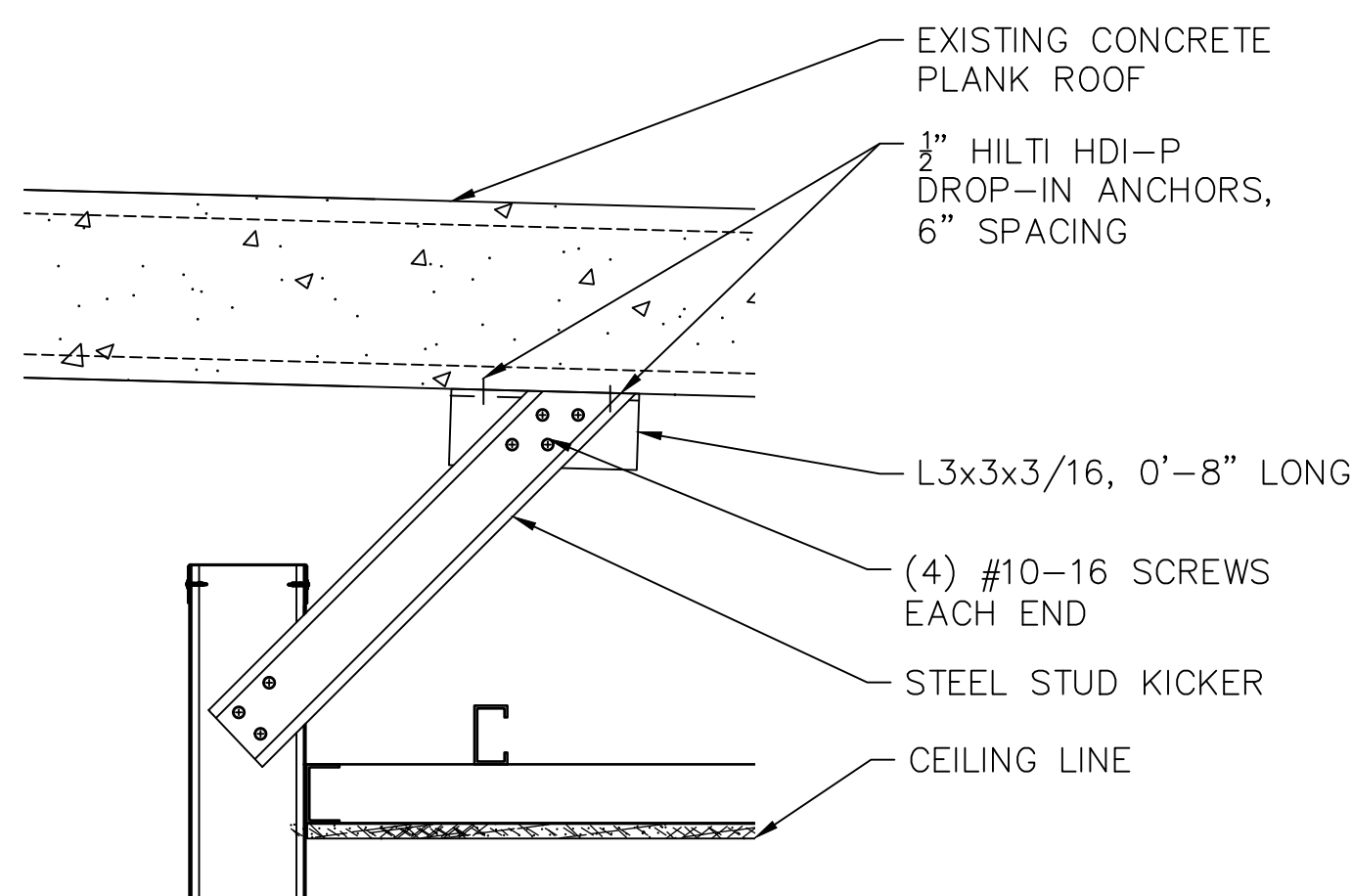
NON-LOAD BEARING TYPE 'B' WALL BRACE, JOISTS PARALLEL



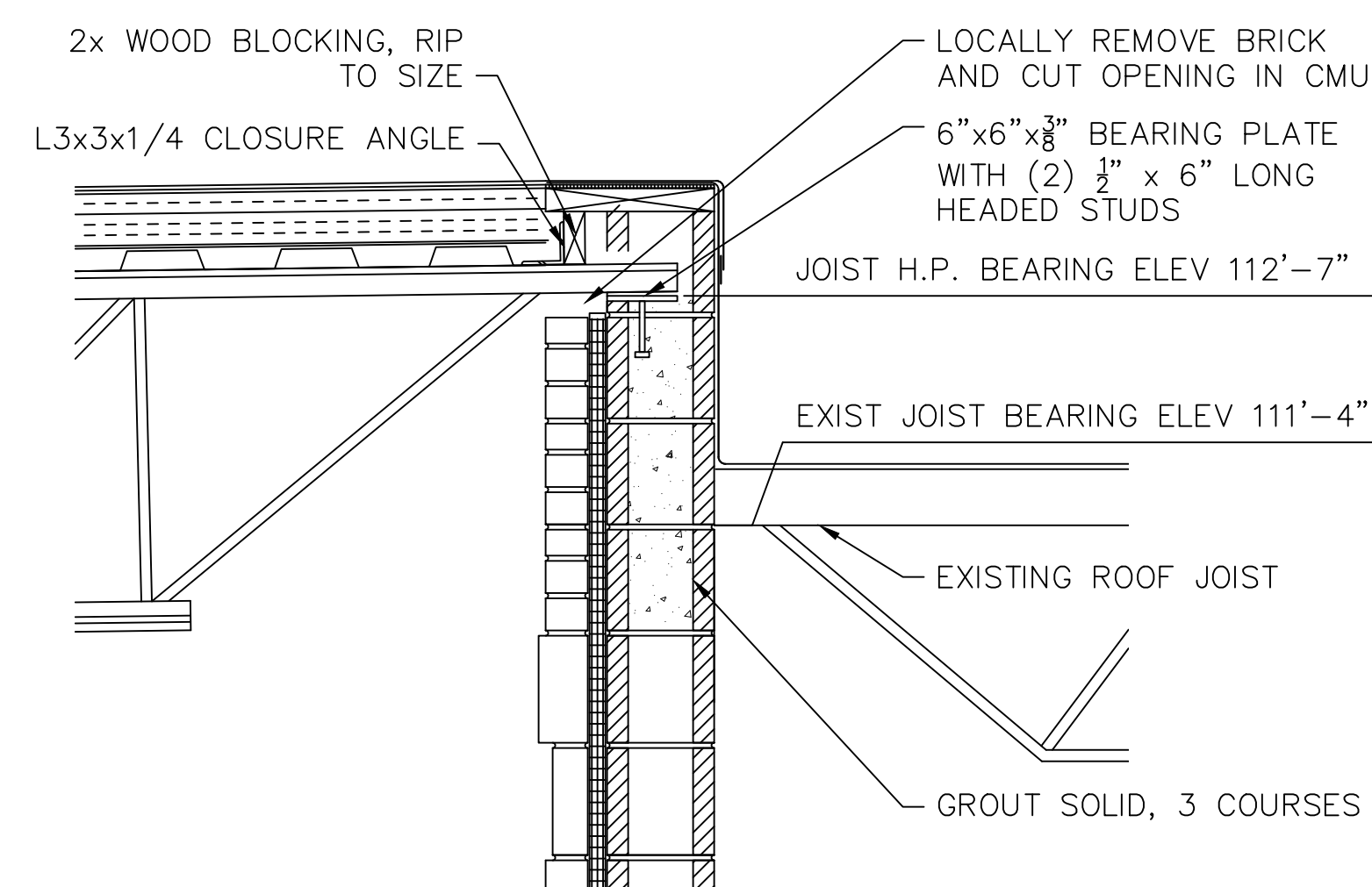
TYPE 'E' WALL BRACE SECTION SCALE: 1" = 1'-0"



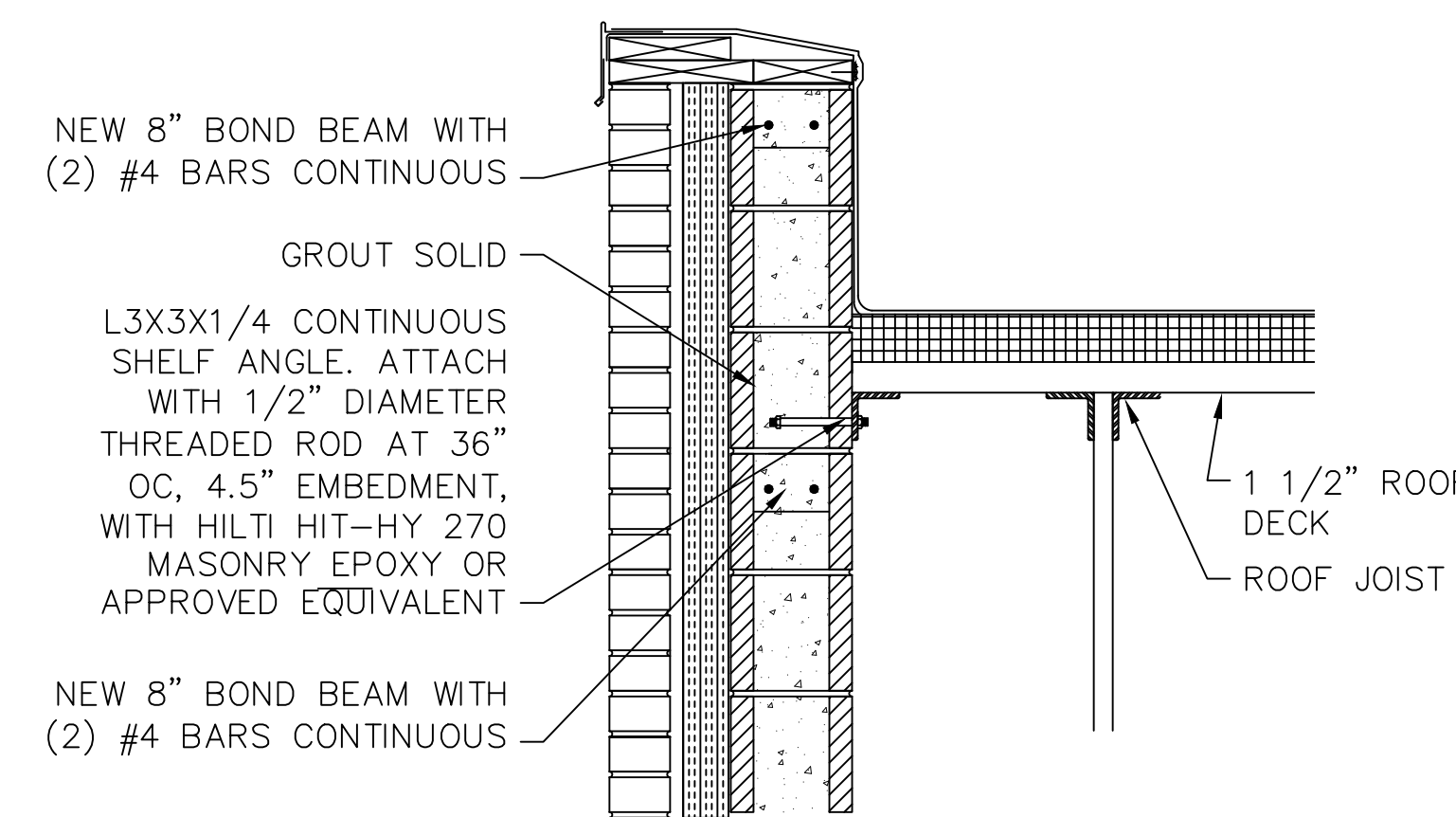
NON-LOAD BEARING TYPE 'E' WALL BRACE, JOISTS PARALLEL



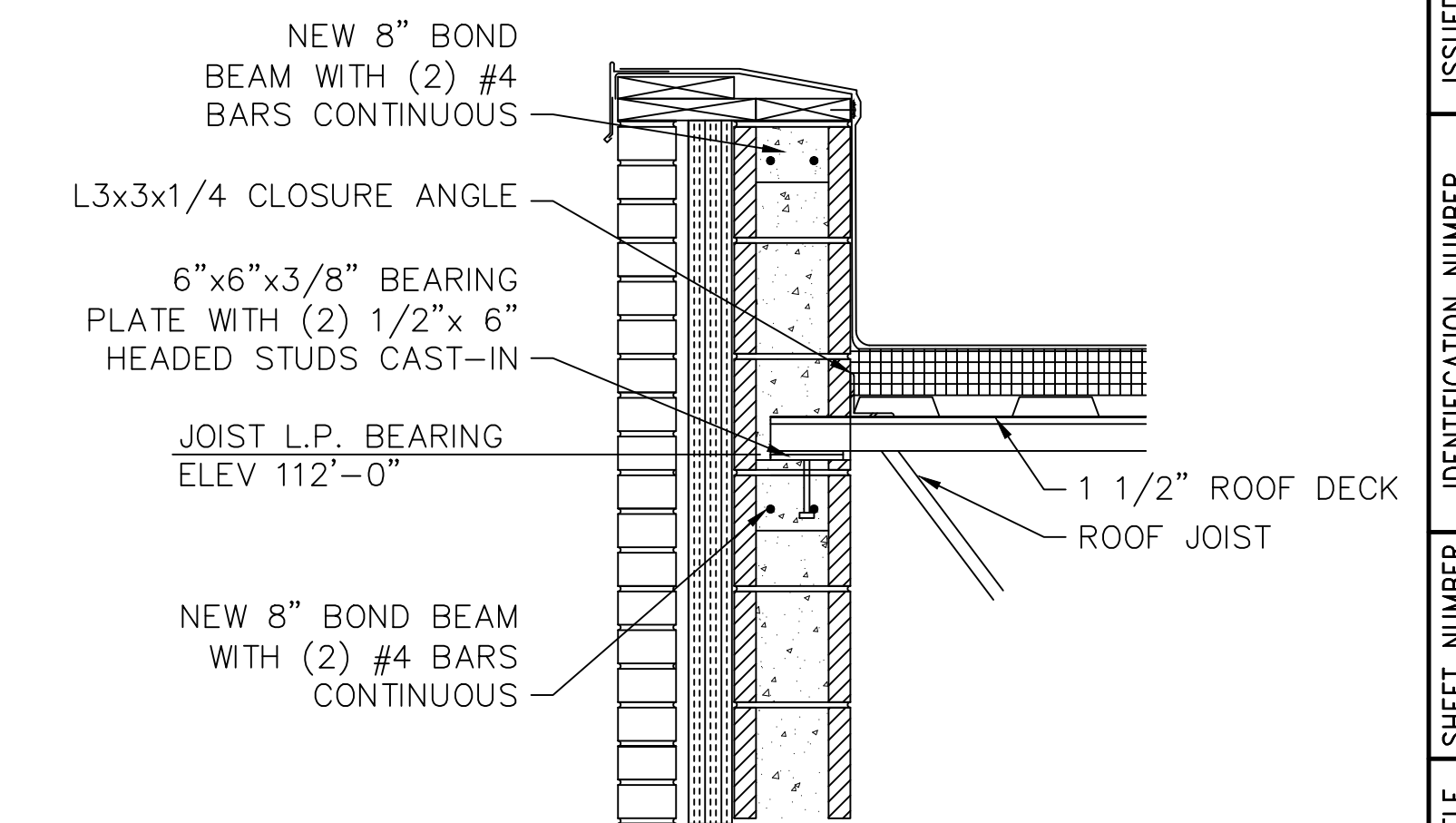
METAL STUD PARTITION WALL ATTACHMENT TO CONCRETE PLANK SCALE: 1" = 1'-0"



JOIST BEARING ON EXISTING WALL SCALE: 1" = 1'-0"

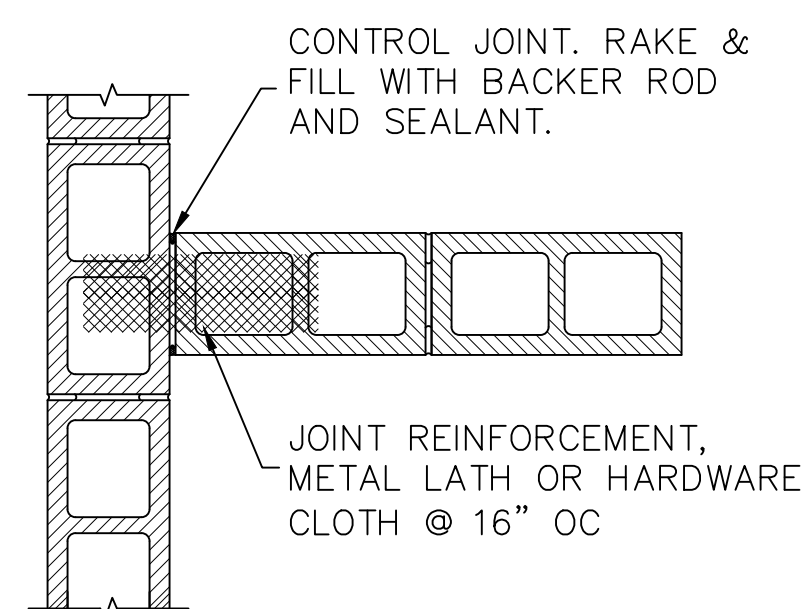


ROOF DECK ATTACHMENT, JOISTS PARALLEL SCALE: 1" = 1'-0"

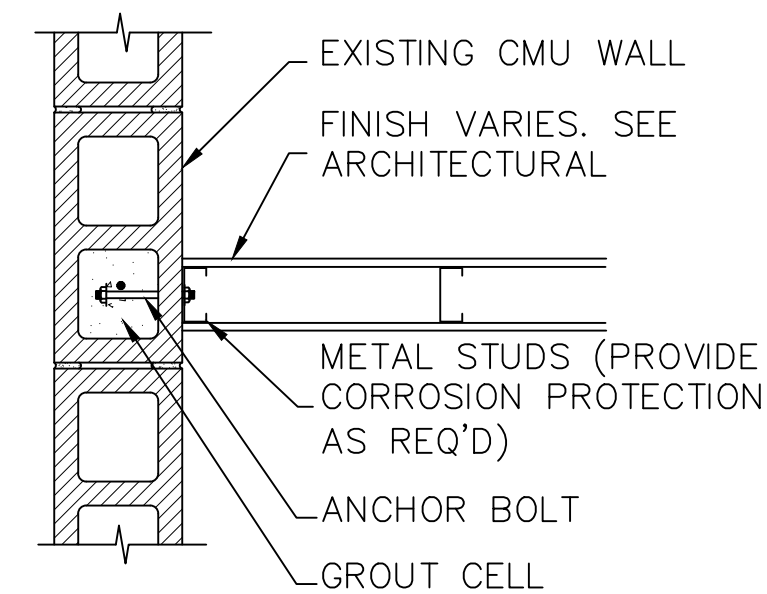


JOIST BEARING AT EXTERIOR WALL SCALE: 1" = 1'-0"

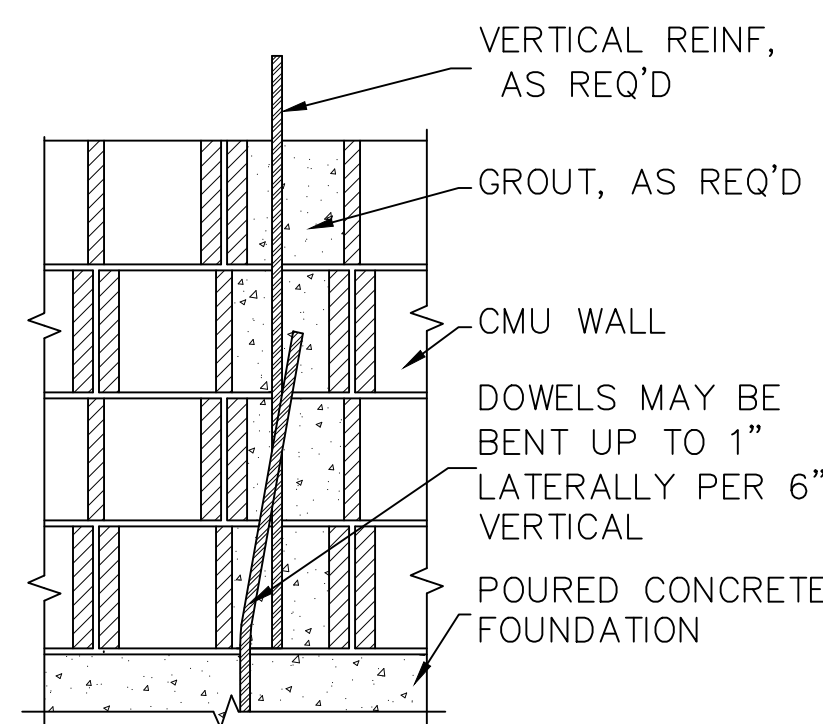




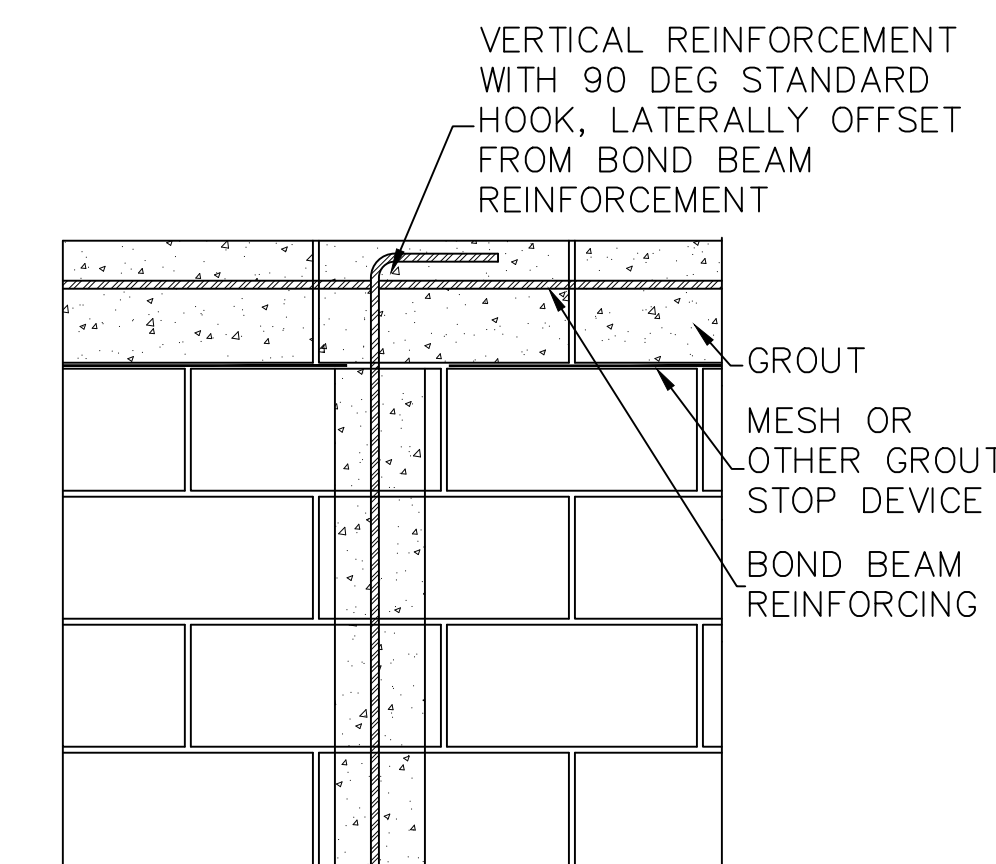
WALL INTERFACE
CMU TO CMU



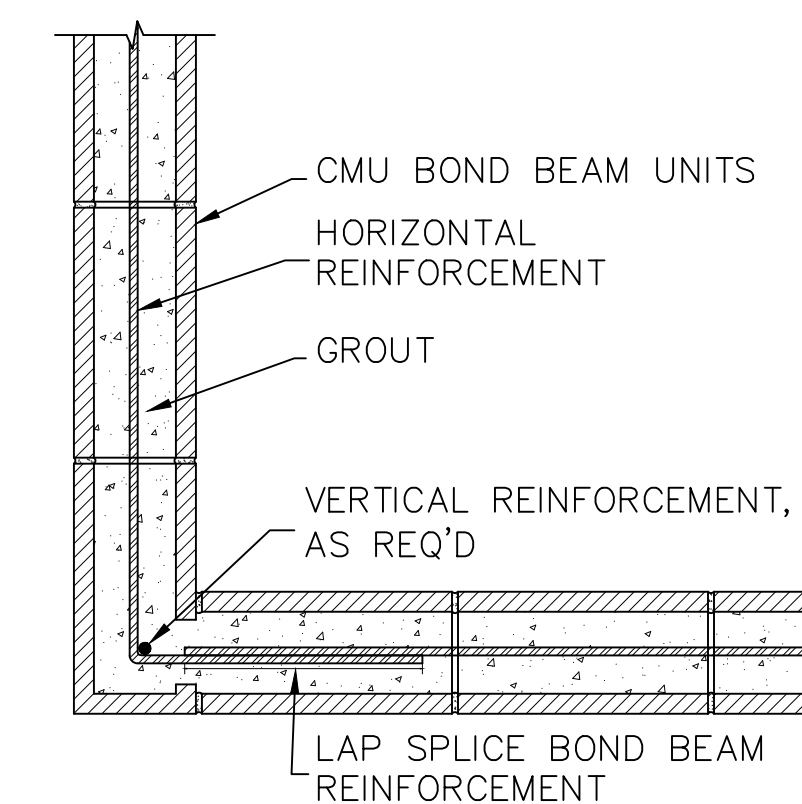
WALL INTERFACE
CFS TO CMU



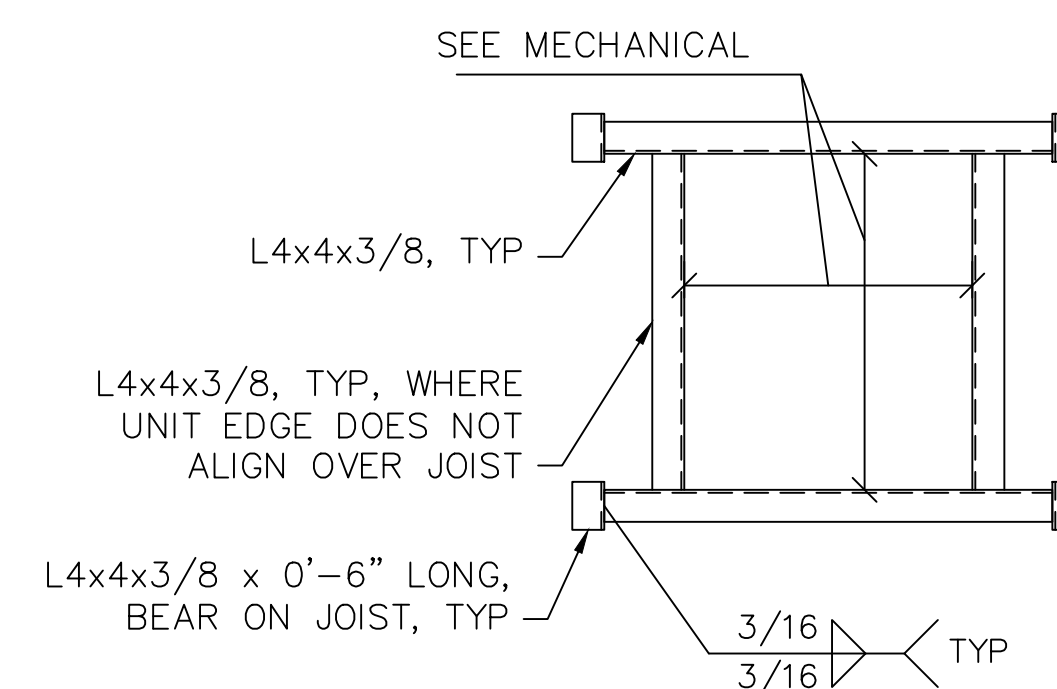
WALL DOWEL ELEVATION



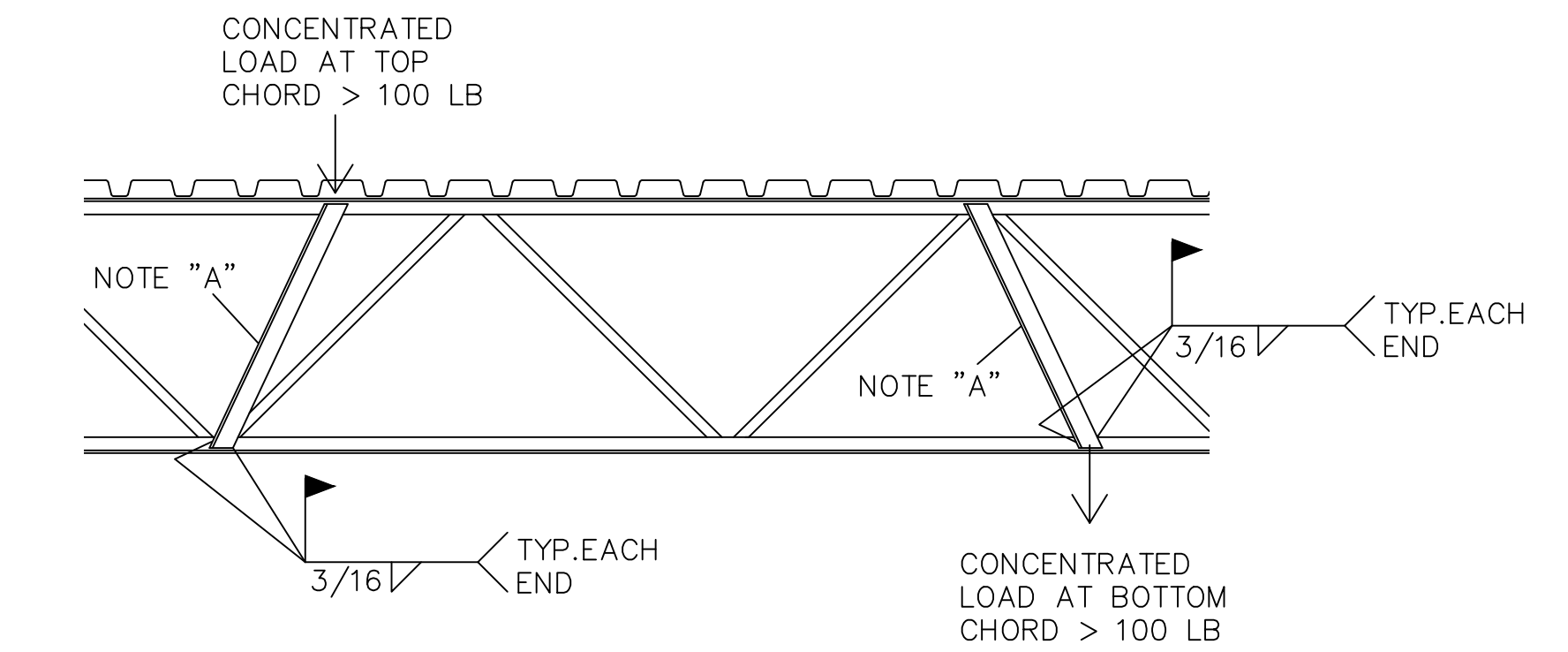
BOND BEAM REINFORCING,
ELEVATION



CORNER BOND BEAM REINFORCING

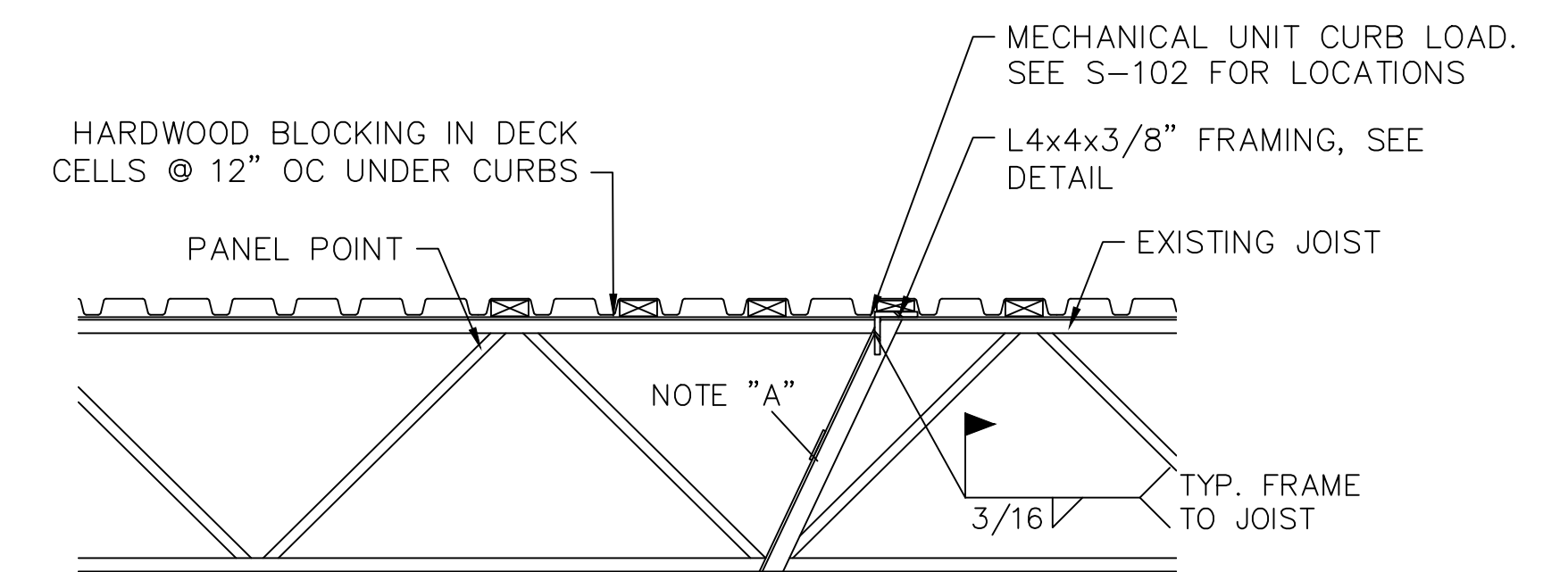


SUPPLEMENTAL FRAMING AT ROOF CURBS



NOTE "A": REINFORCE JOIST WITH 2-L2x2x3/16 WELDED TO JOIST CHORD AT POINT OF LOAD APPLICATION AND AT OPPOSITE CHORD PANEL POINT WHEN LOAD IS FARTHER THAN 6" FROM CHORD PANEL POINT. USE MINIMUM 2" OF 3/16" FILLET WELD AT EACH ANGLE AT EACH END. TIE ANGLES TOGETHER WITH 1/4" PLATE 3" LONG AT CENTER.

JOIST REINFORCING @ CONCENTRATED LOAD > 100 LB



NOTE "A": REINFORCE TOP CHORD OF JOIST WITH 2-L2x2x3/16 WELDED TO TOP CHORD OF JOIST AT LOAD AND TO BOTTOM CHORD AT PANEL POINT WHEN LOAD IS FARTHER THAN 6" FROM TOP CHORD PANEL POINT. USE MINIMUM 2" OF 3/16" FILLET WELD AT EACH ANGLE AT EACH END. TIE ANGLES TOGETHER WITH 1/4" PLATE 3" LONG AT CENTER.

JOIST REINFORCING @ MECHANICAL UNIT ROOF CURB





GENERAL NOTES:

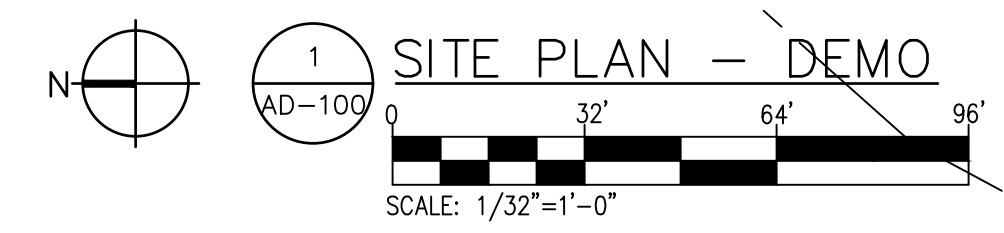
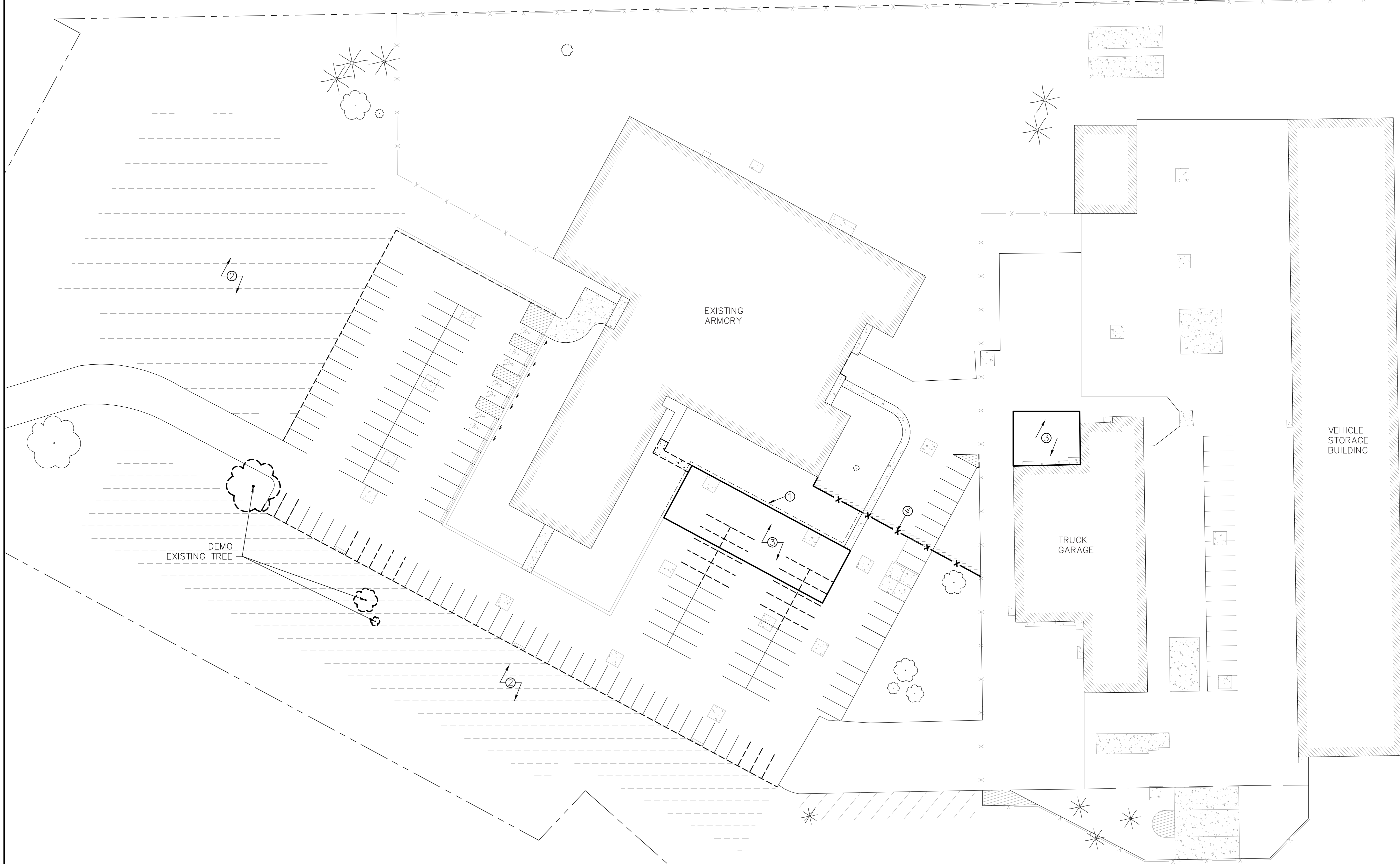
- REFER TO CIVIL DRAWINGS FOR EXTENT OF DEMOLITION. THE CONTRACTOR IS RESPONSIBLE TO DISPOSE OF ALL EXCESS SOILS AND TREES AND BRUSH PER SPECIFICATION ON CIVIL DRAWINGS.

KEY NOTES:

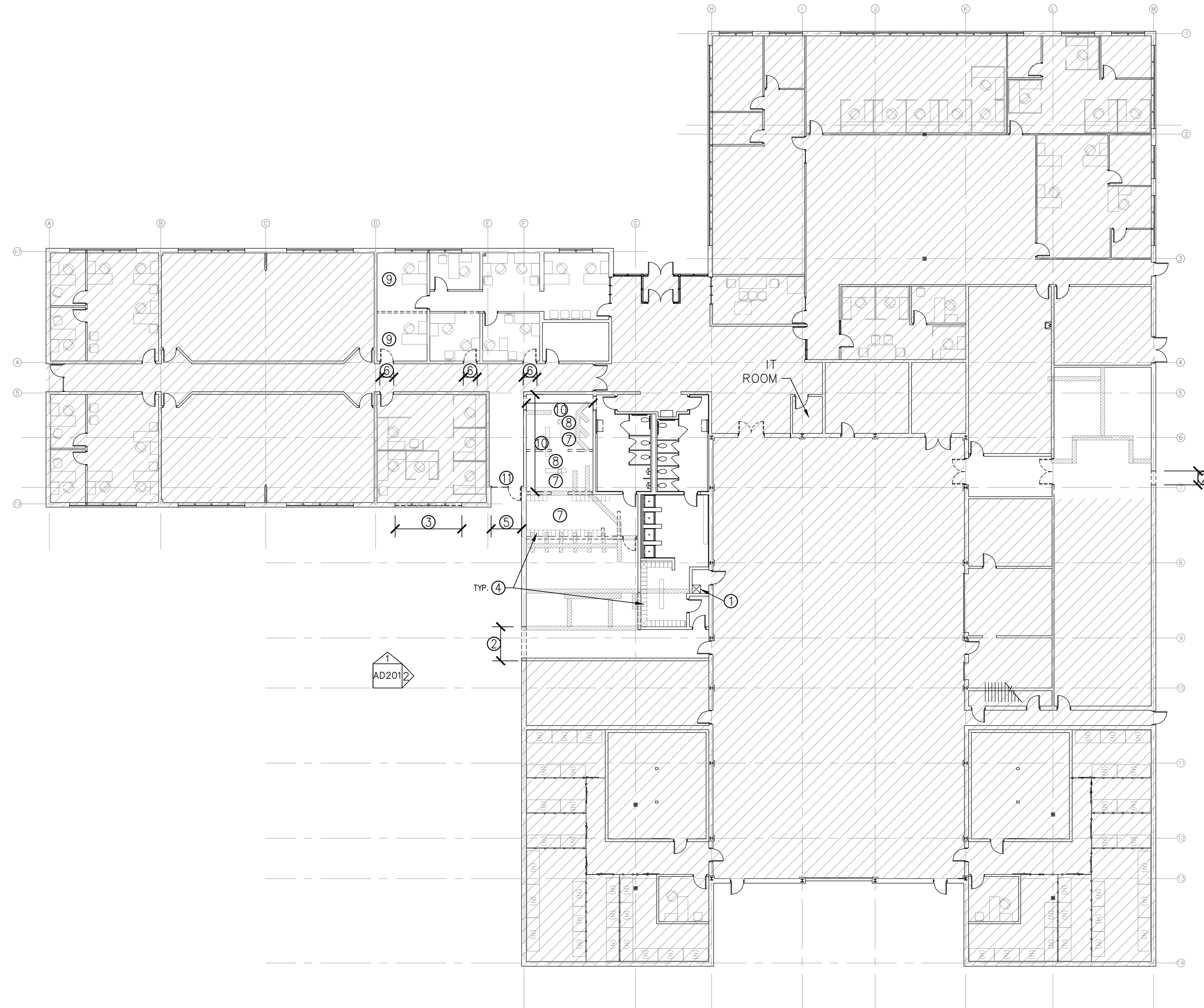
- RELOCATE EXISTING FORCE PROTECTION WALL.
- DEMO LAWN AREA FOR NEW PARKING LOT. TAKE CARE AS EXISTING UTILITIES ARE LOCATED WITHIN THIS AREA. VERIFY EXISTING UTILITY INFORMATION. REFER TO CIVIL DRAWINGS FOR SAWCUT OF EXISTING ASPHALT AND EXTENT OF SITE WORK.
- DEMOLISH ASPHALT
- SALVAGE EXISTING FENCE AND GATE

LEGEND:

- X---X---X DEMO CHAIN LINK FENCE
- X-X-X- EXISTING CHAIN LINK FENCE TO REMAIN
- - - - - PROPERTY LINE



SITE PLAN - DEMO



1 DEMO FLOOR PLAN
 AD-101
 SCALE: 1/16"=1'-0"

GENERAL NOTES:

1. EXISTING WALLS ARE 8" C.M.U TO DECK U.N.O.

KEY NOTES:

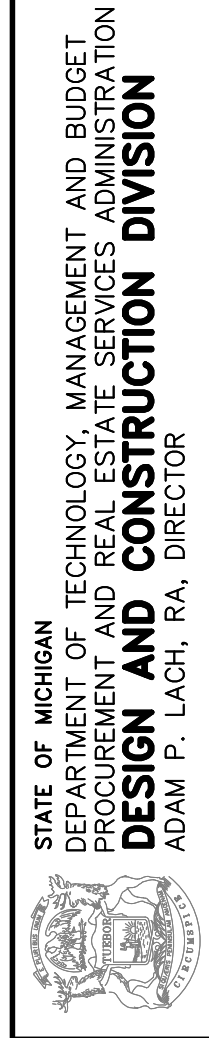
- ① REMOVE FLOOR SINK
- ② DEMO WALL IN ORDER TO INSTALL NEW DOOR
- ③ DEMO WINDOW AND FRAME
- ④ REMOVE AND SALVAGE EXISTING LOCKERS
- ⑤ DEMOLISH DOOR AND WINDOW FOR NEW ADDITION
- ⑥ DEMOLISH DOOR AND FRAME. REPAIR FOR NEW BLOCK INFILL.
- ⑦ REMOVE EXISTING FLOOR TILE AND MUDSET
- ⑧ REMOVE WALL TILE AND PREP WALLS FOR NEW FINISH
- ⑨ REMOVE CARPET AND BASE
- ⑩ SUPPORT WALLS AND CUT TO REMOVE PLUMBING
- ⑪ PREPARE FLOORING FOR NEW SEAMLESS TRANSITION TO NEW FLOORING

LEGEND:

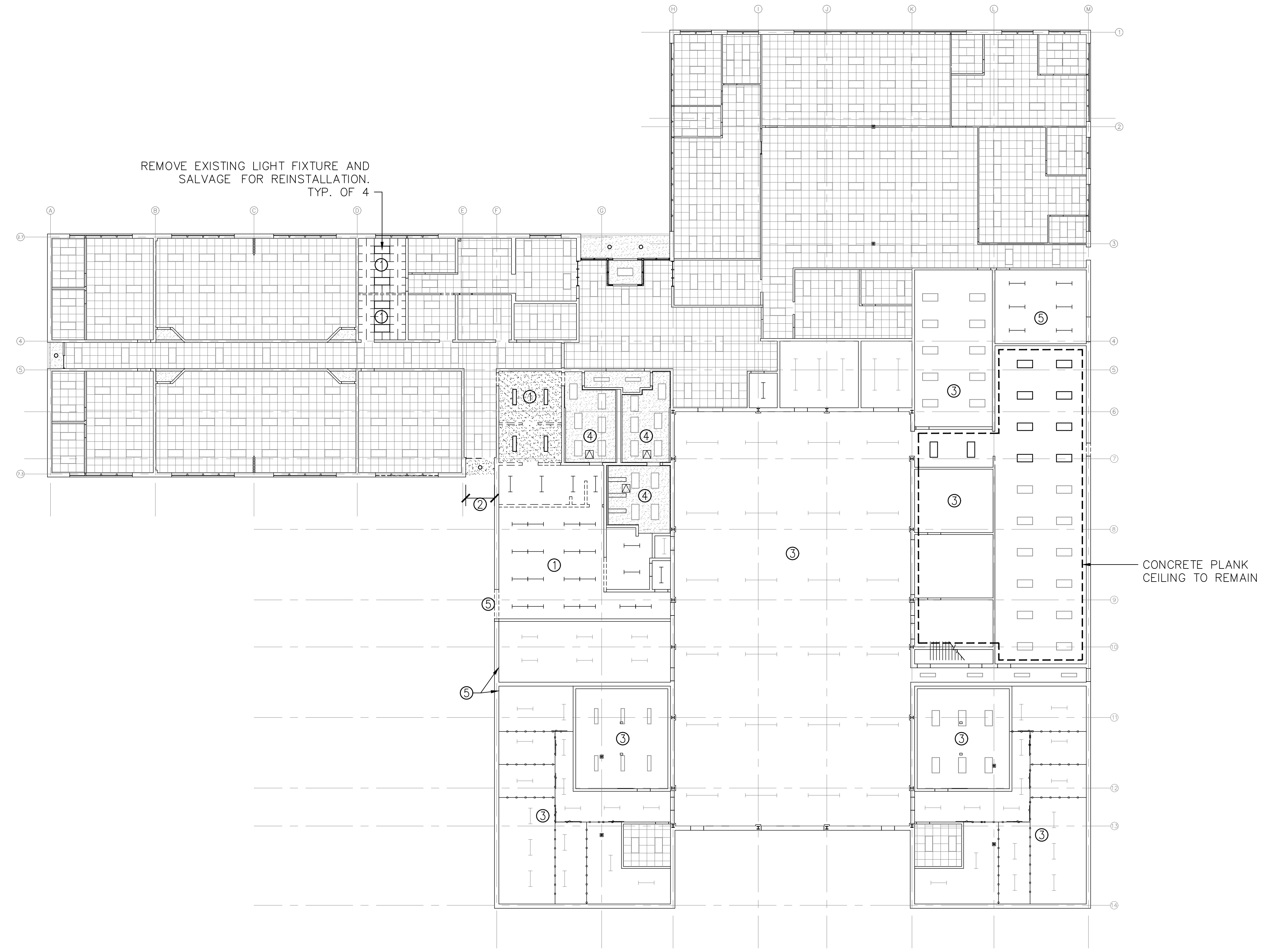
- DEMO DOOR
- EXISTING DOOR
- DEMO WALL
- EXISTING WALL
- EXISTING WINDOWS
- NO DEMO WORK IS TAKING PLACE
- SAWCUT FLOOR / TRENCH GRADE FOR SANITARY WORK. REFER TO MECHANICAL



DRAWING NUMBER AD-101	DRAWING TITLE DEMO FLOOR PLAN — PHASE 1	SHEET NUMBER 30 OF 96	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED DT TDS	PROJECT RENOVATE ARMORY ARMORY
IDENTIFICATION NUMBER PROJECT: WASHIENAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/2126/CAK DWAIA PROJECT NO. 2663022016		DESIGNED DT TDS APPROVED: T. SCHERWITZ		STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR		



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 Royal Oak, MI 48067
 248.542.7866 / www.gfrca.com
FORBES
 ARCHITECTS, P.C.



GENERAL NOTES:

1. WORK ABOVE THE CEILING THROUGHOUT THE FACILITY TO INSTALL NEW FIRE SUPPRESSION SYSTEM – REFER TO MECHANICAL. TAKE CARE AS CEILING AND LIGHTING IS TO BE REINSTALLED.

KEYNOTES:

- ① REMOVE CEILING AND LIGHTING FIXTURES
- ② DEMO AND PREPARE ENTRY AREA FOR CONSTRUCTION FOR THE NEW ADDITION
- ③ (E) SPRINKLERS IN THIS AREA – RECONFIGURE AS REQUIRED TO ACHIEVE COMPLETE PROTECTION – REFER TO MECHANICAL
- ④ CUT AND PATCH DRYWALL CEILING AS NECESSARY TO INSTALL SPRINKLER SYSTEM, REFER TO MECHANICAL.
- ⑤ CUT OPENING FOR NEW MECHANICAL / PLUMBING

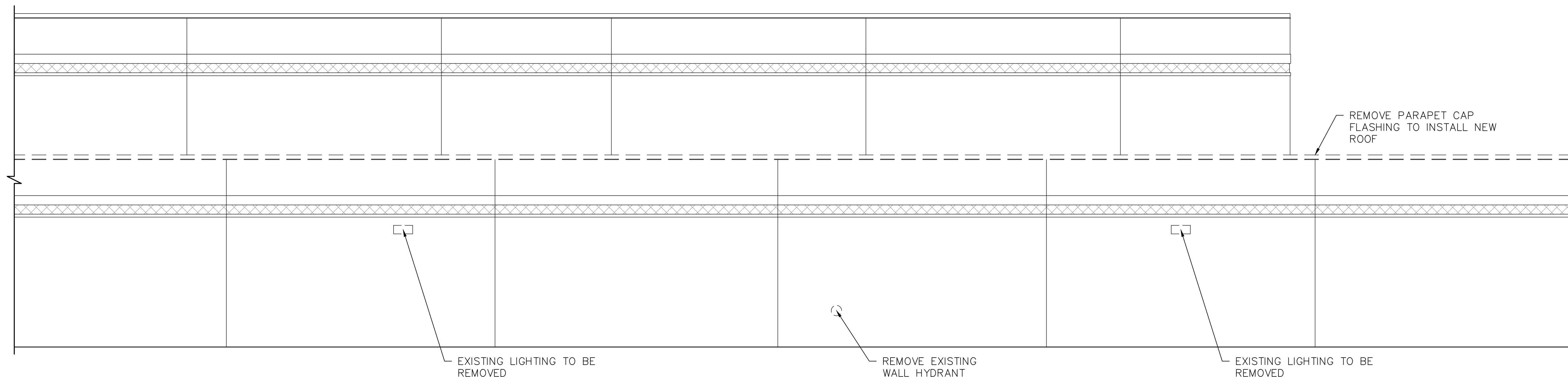
LEGEND:

- EXISTING CEILING GRID TO REMAIN
- EXISTING LIGHT FIXTURES TO REMAIN
- DEMO CEILING GRID AND TILE
- DEMO LIGHT FIXTURES
- DEMO WALL
- EXISTING WALL
- DEMO EXISTING PLASTER SOFFIT/CEILING

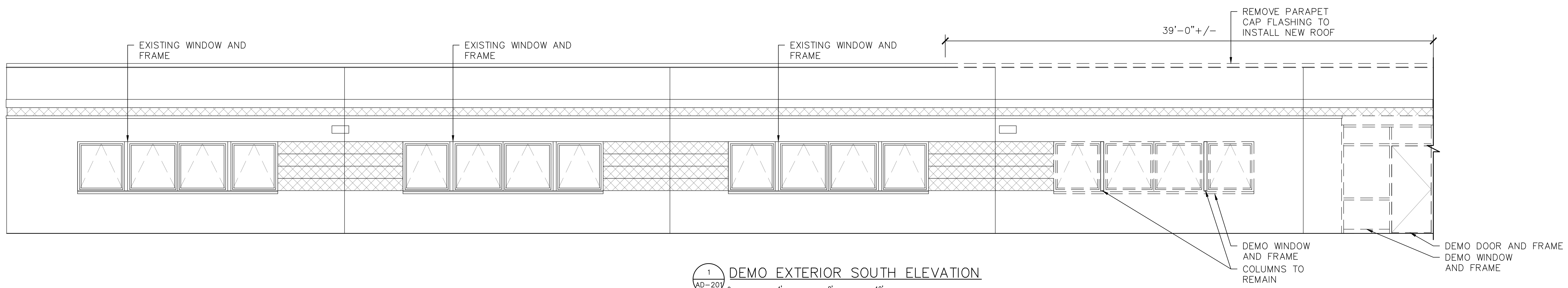
1
 AD-102
 DEMO REFLECTED CEILING PLAN
 SCALE: 1/16"=1'-0"



DRAWING NUMBER	AD-102	DRAWING TITLE	DEMO REFLECTED CEILING PLAN - PHASE 1	SHEET NUMBER	31 OF 96	IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/2126/CAK DWG/A PROJECT NO. 2668022016	ISSUED FOR	CONSTRUCTION DOCUMENTS	DATE	04/01/2022	DESIGNED	DT	PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR 															
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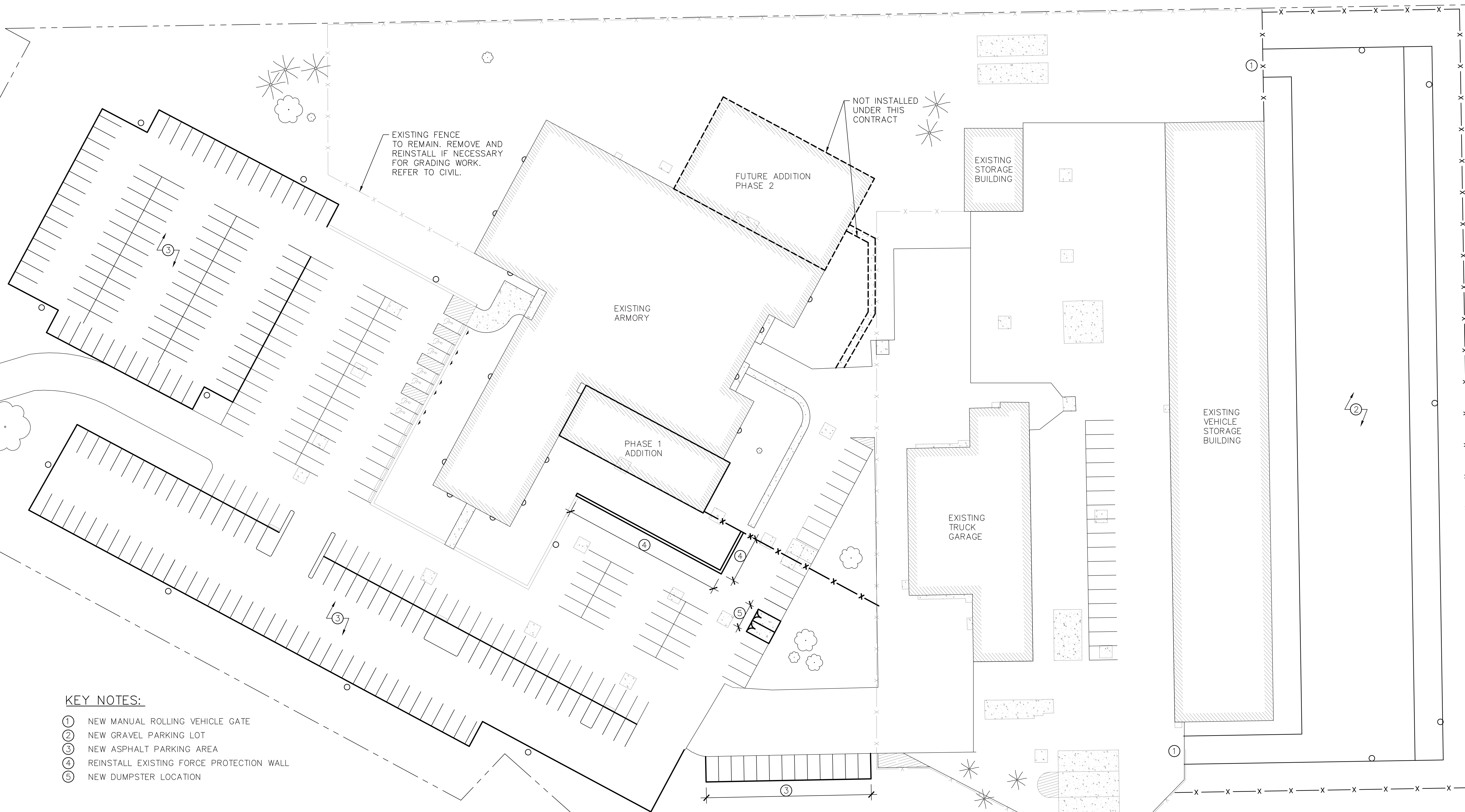
2 DEMO EXTERIOR WEST ELEVATION
 AD-201 SCALE: 1/4" = 1'-0"



1 DEMO EXTERIOR SOUTH ELEVATION
 AD-201 SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. REFER TO CIVIL DRAWINGS FOR EXTENT OF NEW WORK.

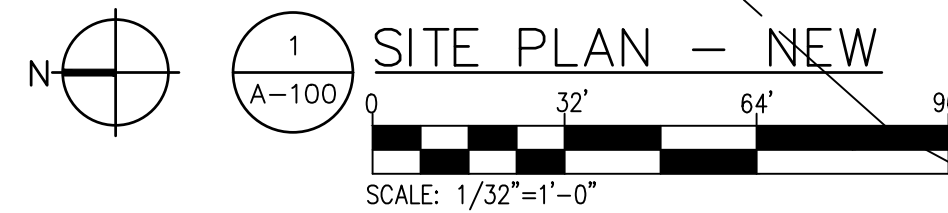


KEY NOTES:

- 1 NEW MANUAL ROLLING VEHICLE GATE
- 2 NEW GRAVEL PARKING LOT
- 3 NEW ASPHALT PARKING AREA
- 4 REINSTALL EXISTING FORCE PROTECTION WALL
- 5 NEW DUMPSTER LOCATION

LEGEND:

- x — x — NEW CHAIN LINK FENCE
- x — x — x — EXISTING CHAIN LINK FENCE TO REMAIN
- - - - - PROPERTY LINE
- NEW POLE MOUNTED LIGHT FIXTURE
- ◐ NEW WALL MOUNTED LIGHT FIXTURE



DETENTION POND REFER TO CIVIL DRAWINGS



DRAWING NUMBER A-100	DRAWING TITLE SITE PLAN - NEW	SHEET NUMBER 33 OF 96	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED DT TDS	PROJECT RENOVATE ARMORY WASHTEAW ARMORY	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR
	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/2126/CAK DMA PROJECT NO. 2668022016		APPROVED T. SCHERWITZ	FORBES ARCHITECTS, P.C. 816 E. 4th ST. Royal Oak, MI 48067 248.542.7866 / www.gfrca.com			



GENERAL NOTES:

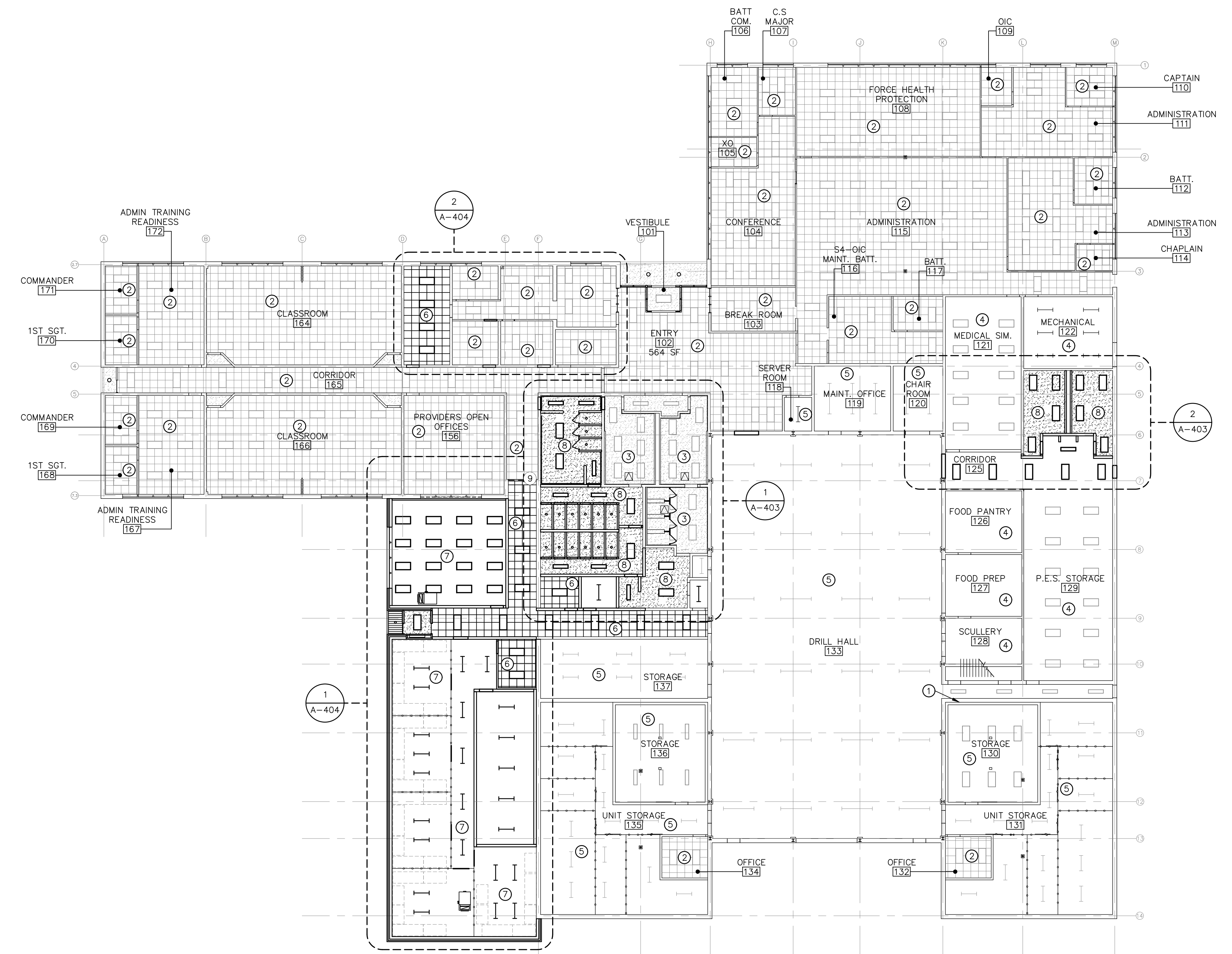
1. WORK ABOVE THE CEILING THROUGHOUT THE FACILITY TO INSTALL NEW FIRE SUPPRESSION SYSTEM - REFER TO MECHANICAL. REMOVE AND REINSTALL CEILING AND LIGHTING AS REQUIRED.

KEY NOTES:

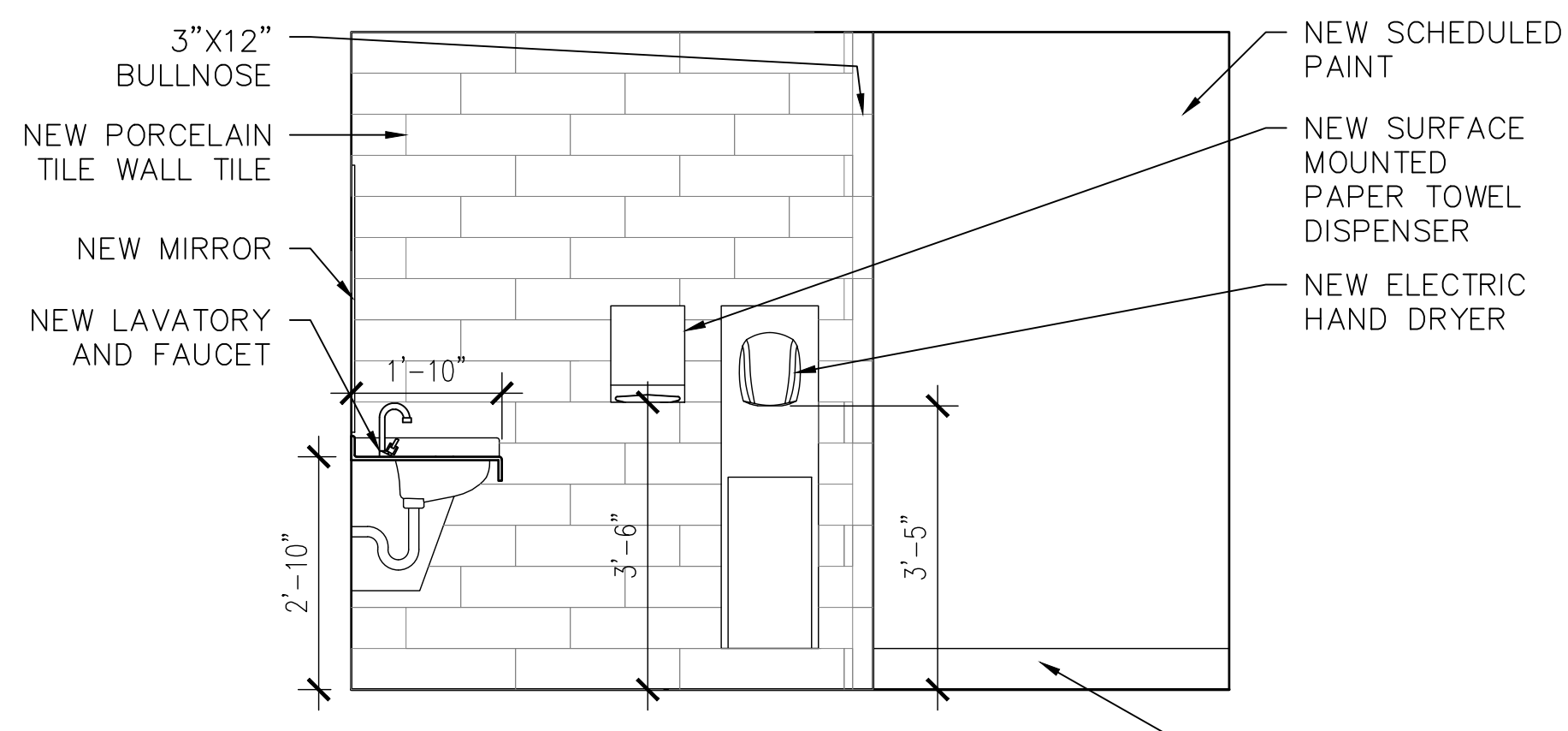
1. FIRE STOP OPENINGS IN EXISTING WALL WHERE PIPES PENETRATE.
2. MODIFY AND REPAIR EXISTING CEILING GRID AND TILES AS NECESSARY TO INSTALL NEW ENTIRE BUILDING FIRE SPRINKLER SYSTEM
3. MODIFY AND REPAIR EXISTING GYPSUM BOARD CEILING AS NECESSARY TO INSTALL NEW ENTIRE BUILDING FIRE SPRINKLER SYSTEM.
4. EXPOSED CONCRETE PLANK CEILING. INSTALL NEW ENTIRE BUILDING FIRE SPRINKLER SYSTEM.
5. CEILING OPEN TO METAL JOISTS. INSTALL NEW ENTIRE BUILDING FIRE SPRINKLER SYSTEM.
6. INSTALL NEW SPRINKLER SYSTEM IN NEW LAY IN CEILING
7. INSTALL NEW SPRINKLER SYSTEM IN NEW CEILING OPEN TO METAL JOISTS.
8. INSTALL NEW SPRINKLER SYSTEM IN NEW GYPSUM BOARD CEILING
9. INSTALL GYPSUM BOARD SOFFIT FOR CEILING TRANSITION

LEGEND:

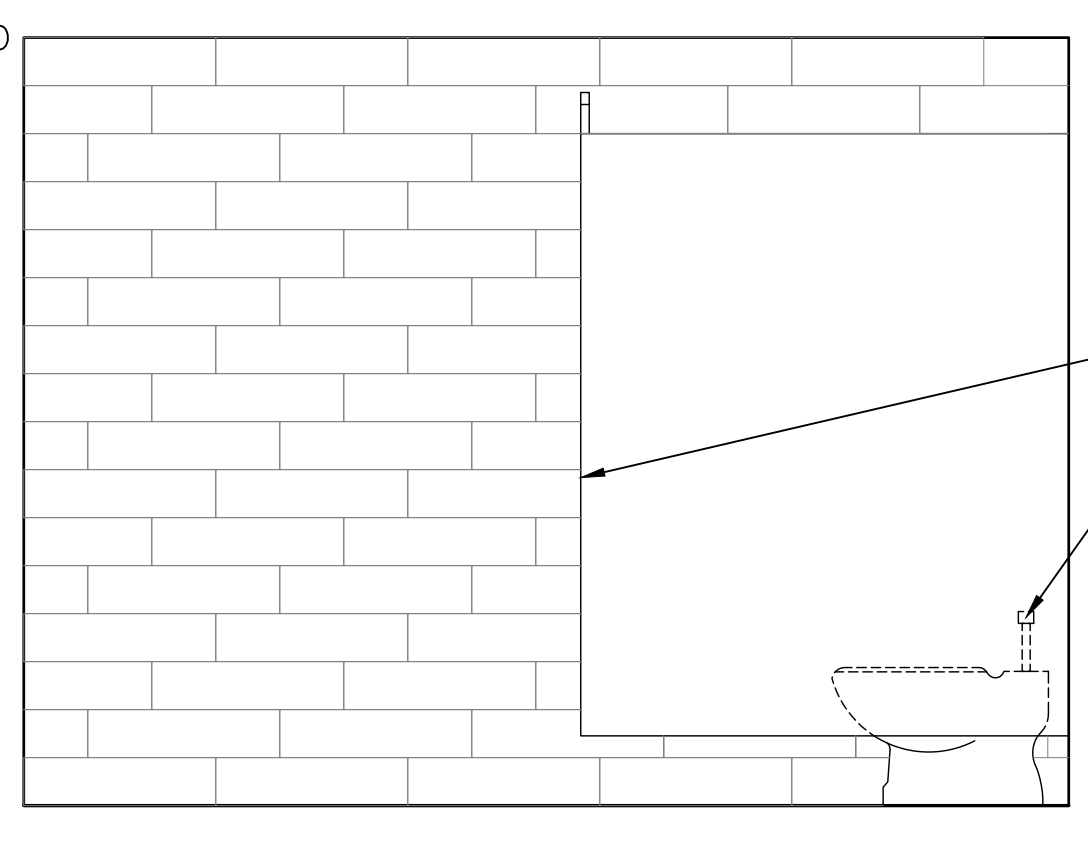
- EXISTING CEILING GRID
- EXISTING LIGHT FIXTURES
- EXISTING GYPSUM BOARD CEILING
- NEW CEILING GRID AND TILE
- NEW LIGHT FIXTURE
- NEW GYPSUM BOARD CEILING



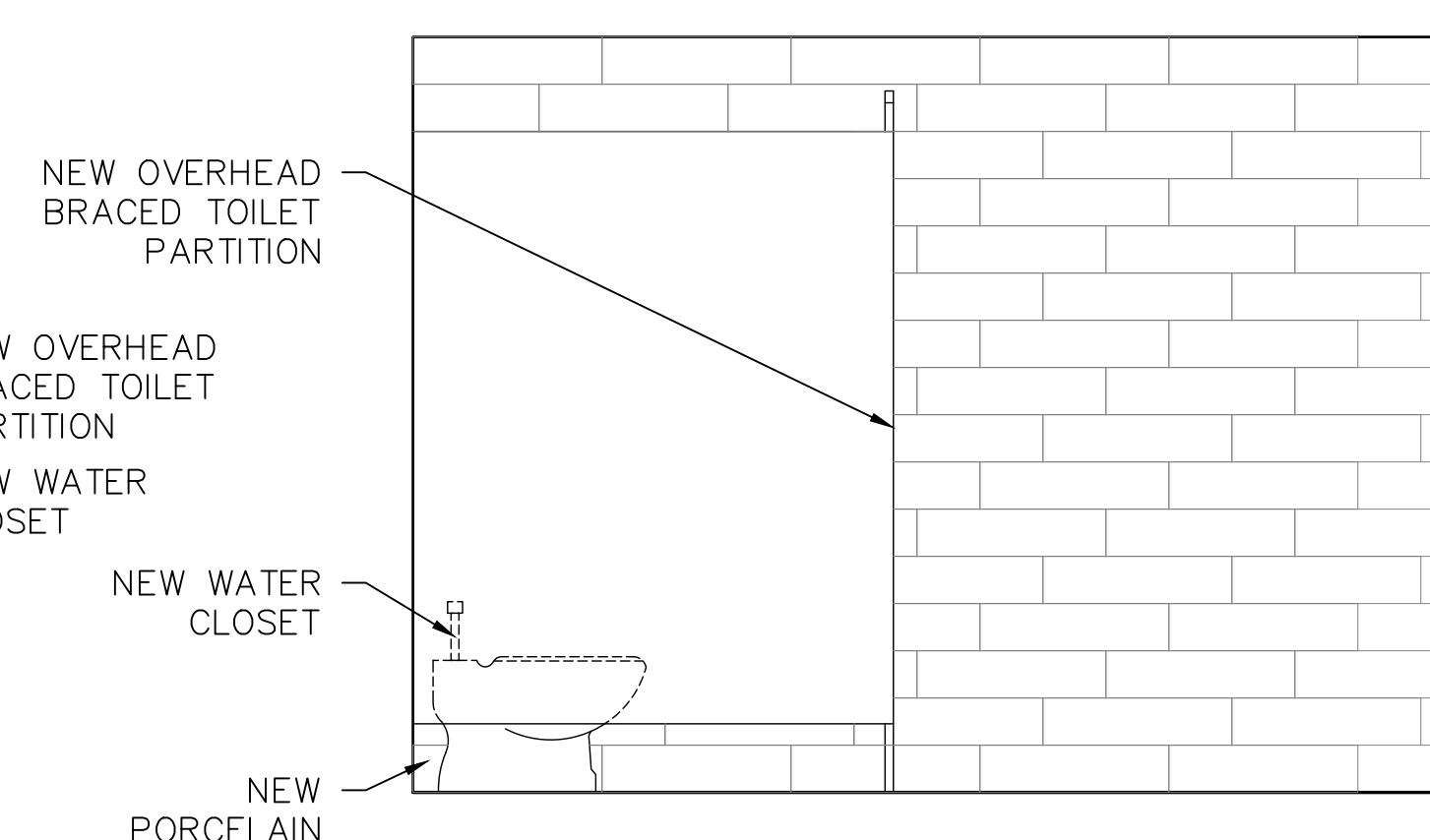
N
 1
 A-102
NEW REFLECTED CEILING PLAN
 0 16' 32' 48'
 SCALE: 1/16"=1'-0"



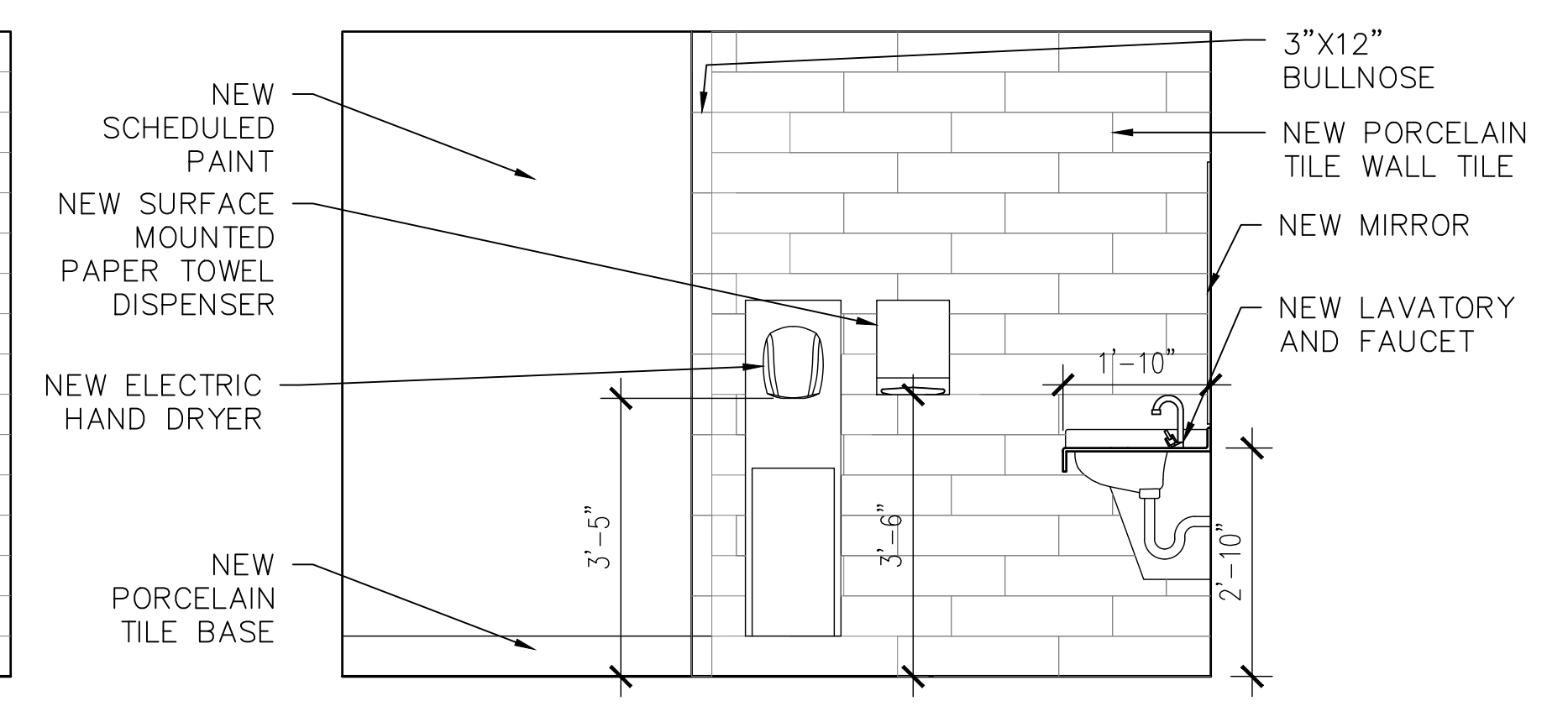
10
A-201
MEN'S LATRINE SOUTH ELEVATION
SCALE: 1/2" = 1'-0"



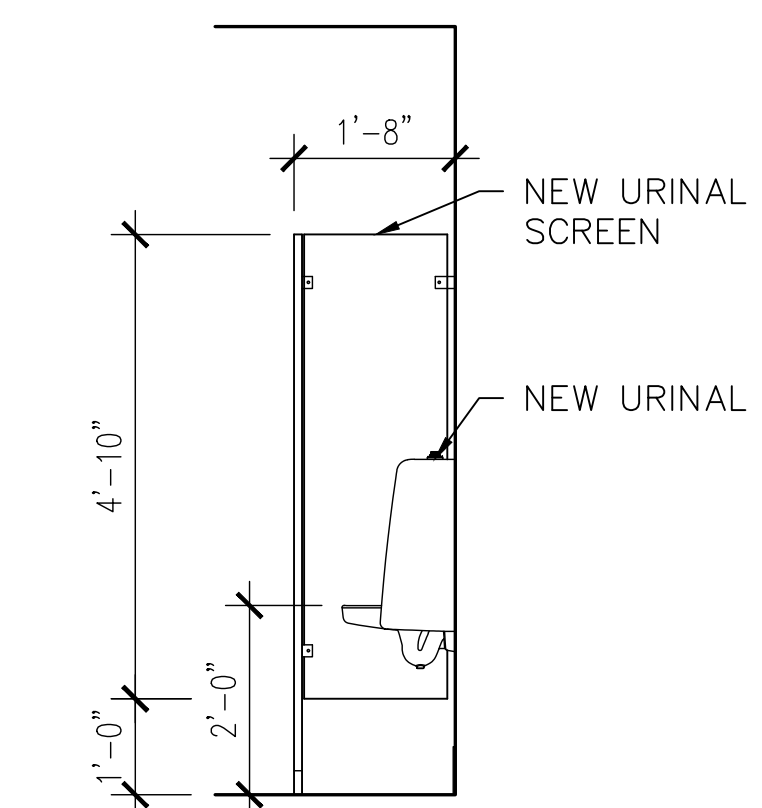
9
A-201
MEN'S LATRINE NORTH ELEVATION
SCALE: 1/2" = 1'-0"



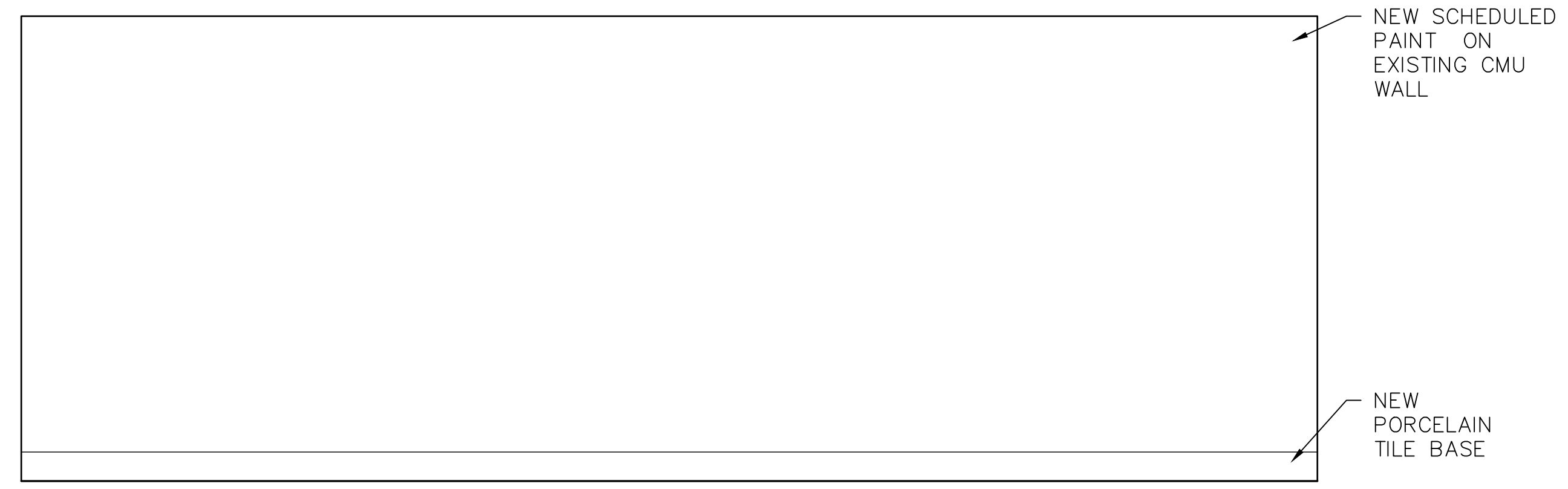
5
A-201
WOMEN'S LATRINE WEST ELEVATION
SCALE: 1/2" = 1'-0"



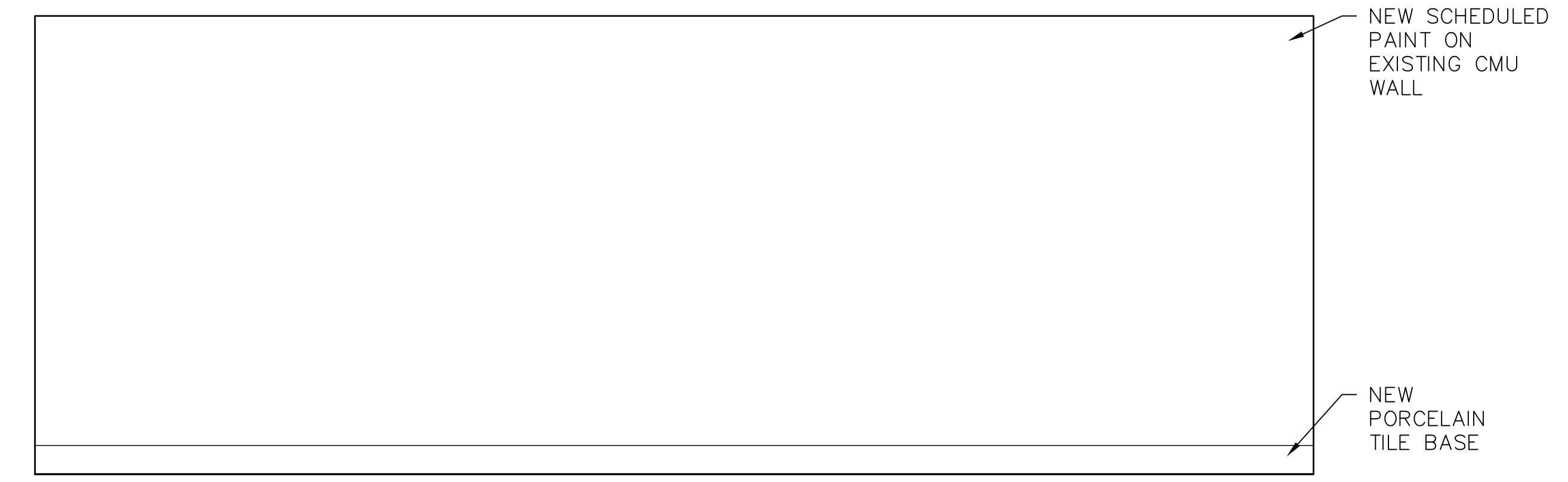
4
A-201
WOMEN'S LATRINE SOUTH ELEVATION
SCALE: 1/2" = 1'-0"



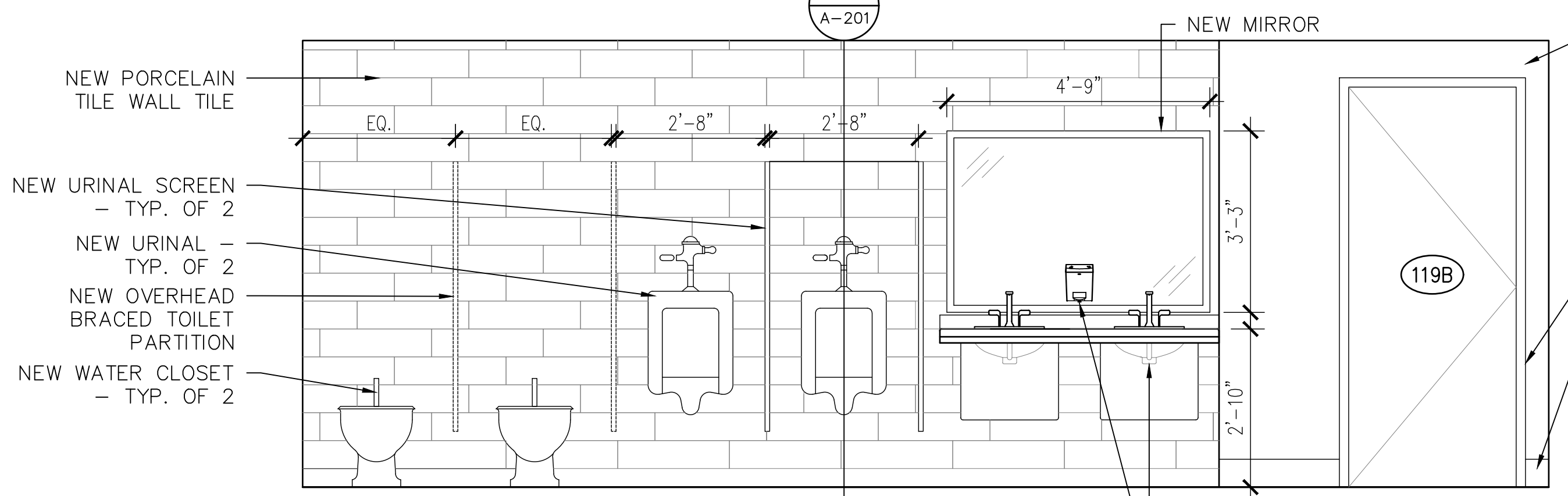
11
A-201
URINAL SECTION
SCALE: 1/2" = 1'-0"



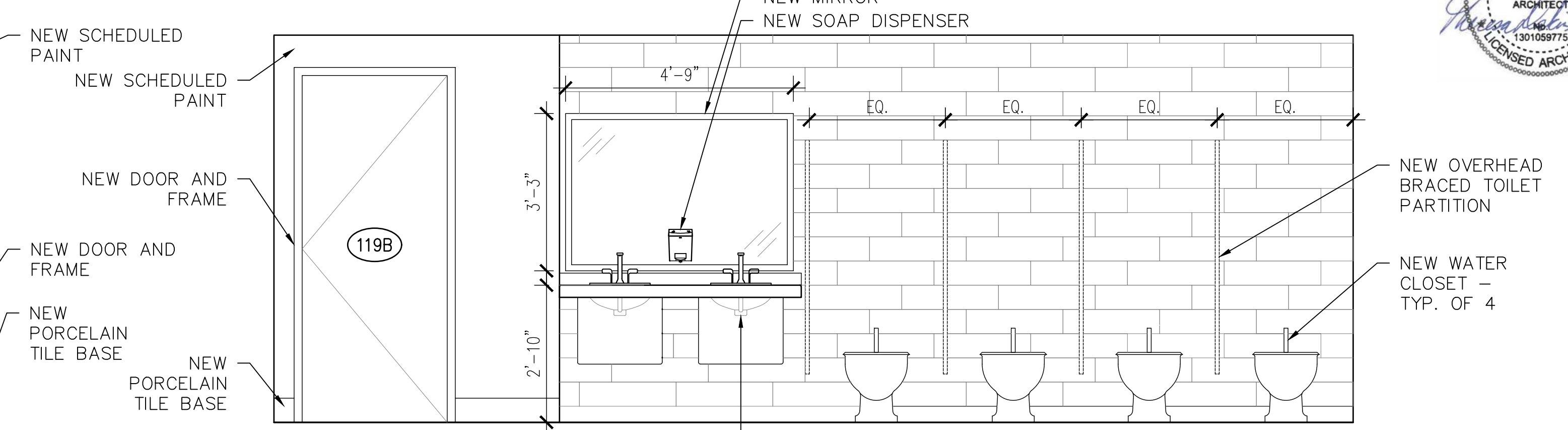
8
A-201
MEN'S LATRINE WEST ELEVATION
SCALE: 1/2" = 1'-0"



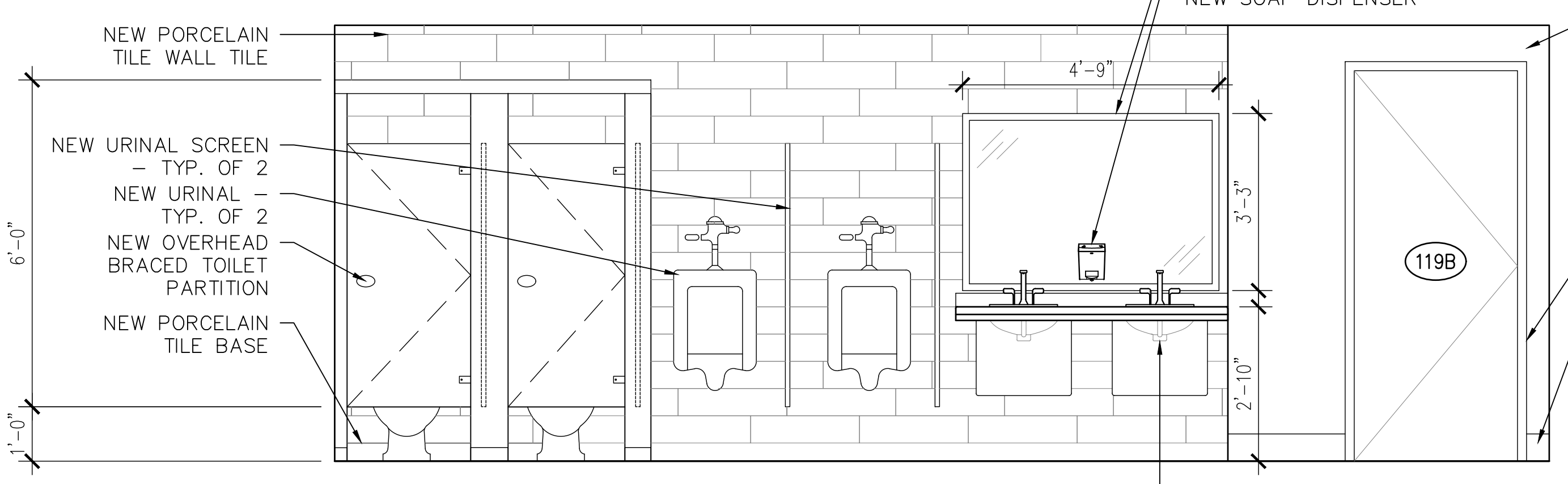
3
A-201
WOMEN'S LATRINE EAST ELEVATION
SCALE: 1/2" = 1'-0"



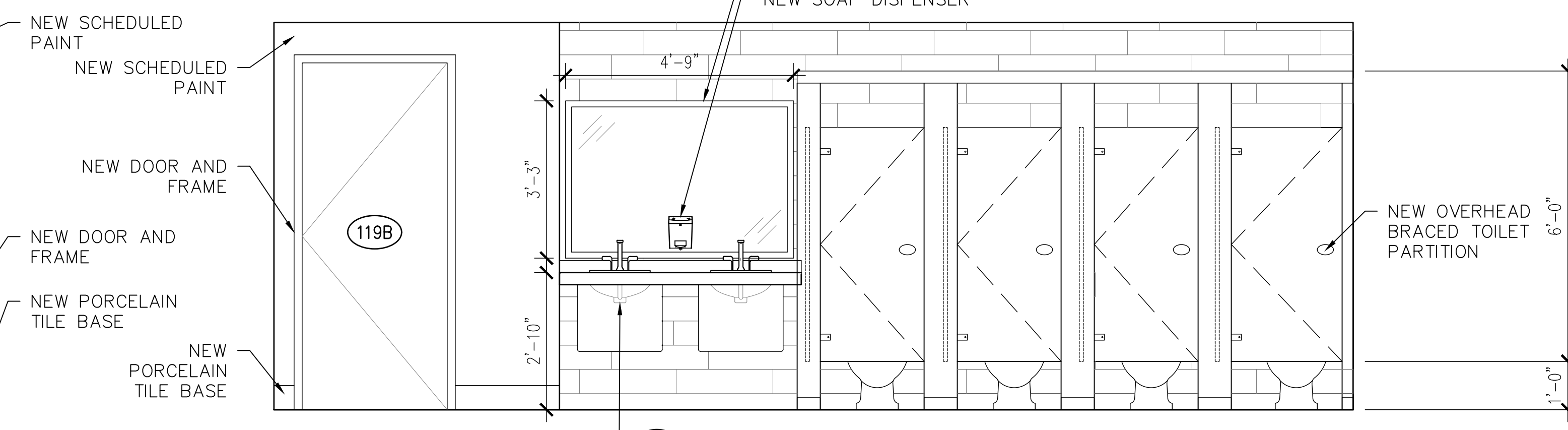
7
A-201
MEN'S LATRINE EAST ELEVATION
SCALE: 1/2" = 1'-0"



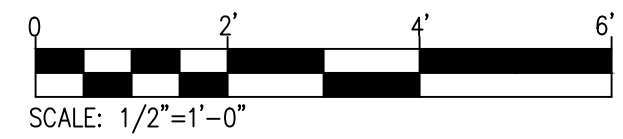
2
A-201
WOMEN'S LATRINE WEST ELEVATION
SCALE: 1/2" = 1'-0"

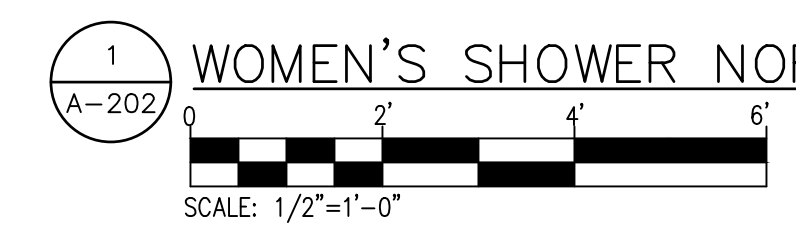
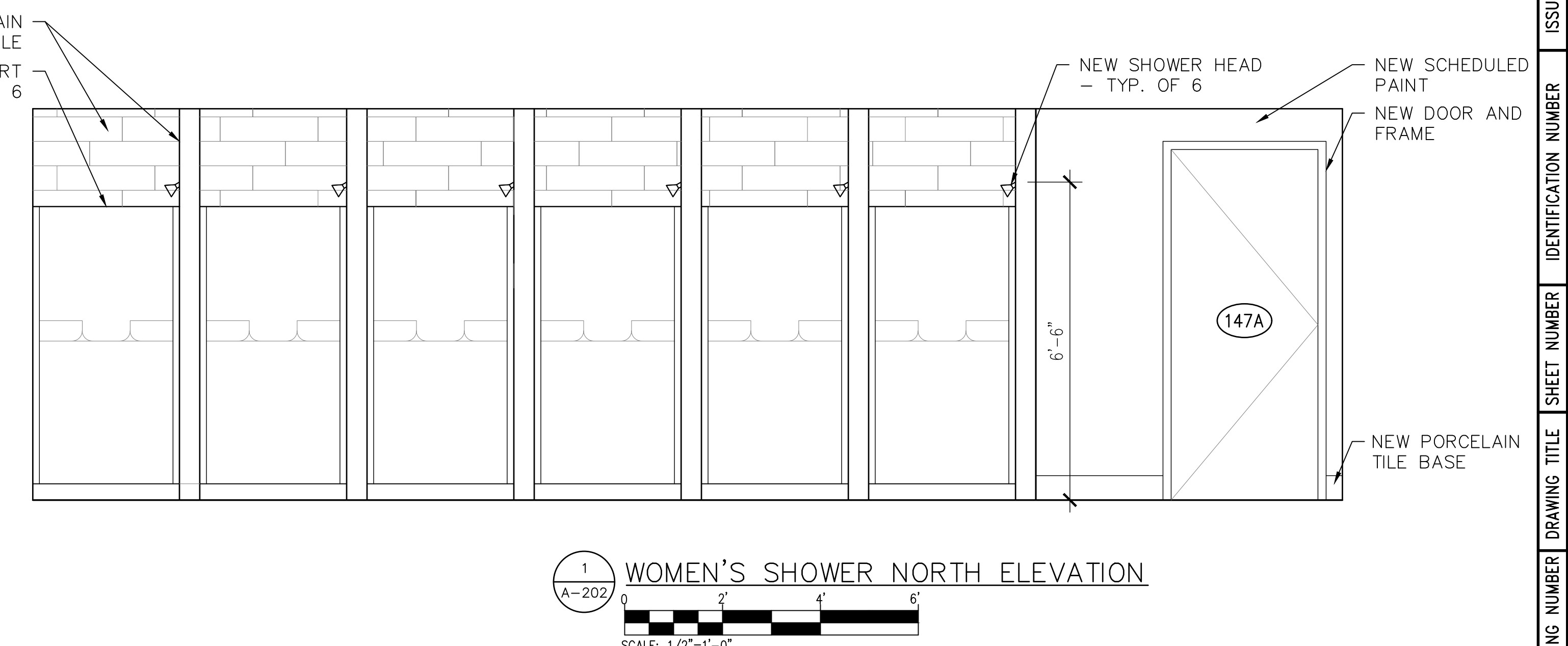
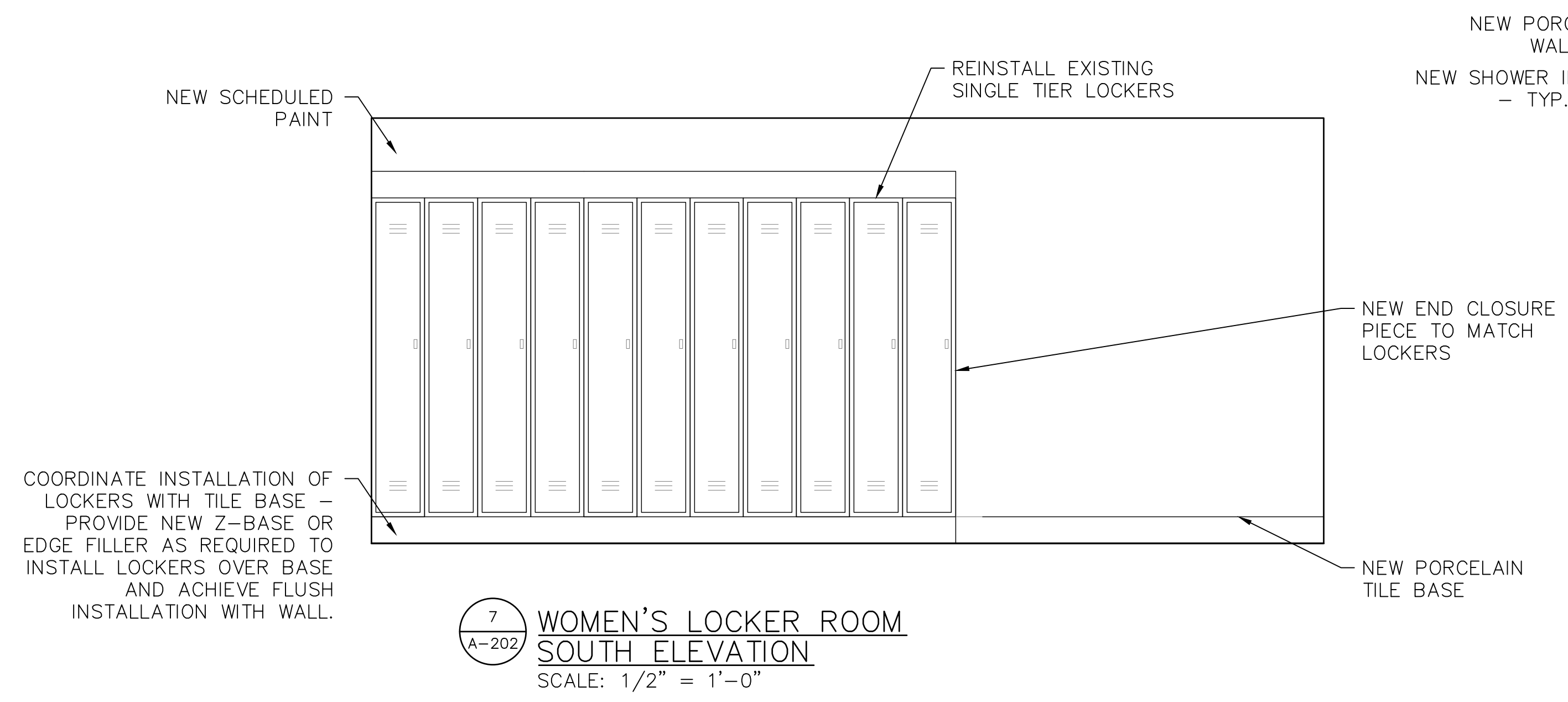
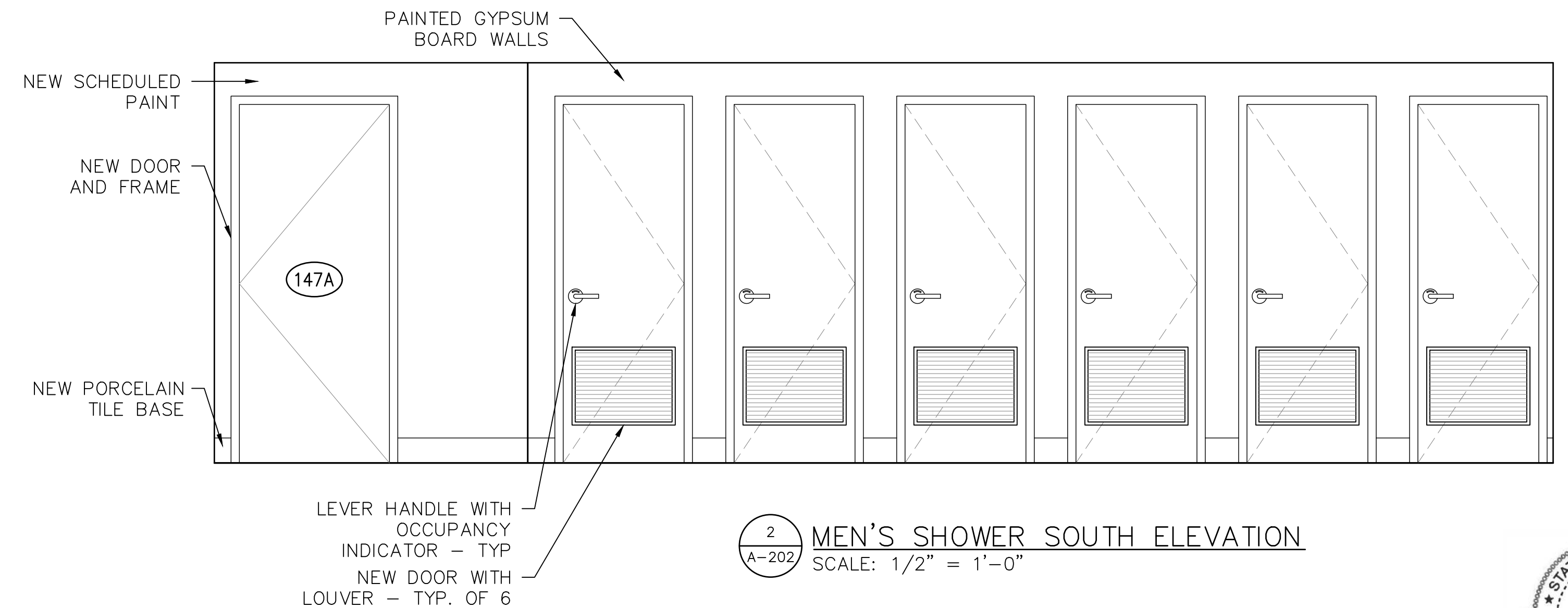
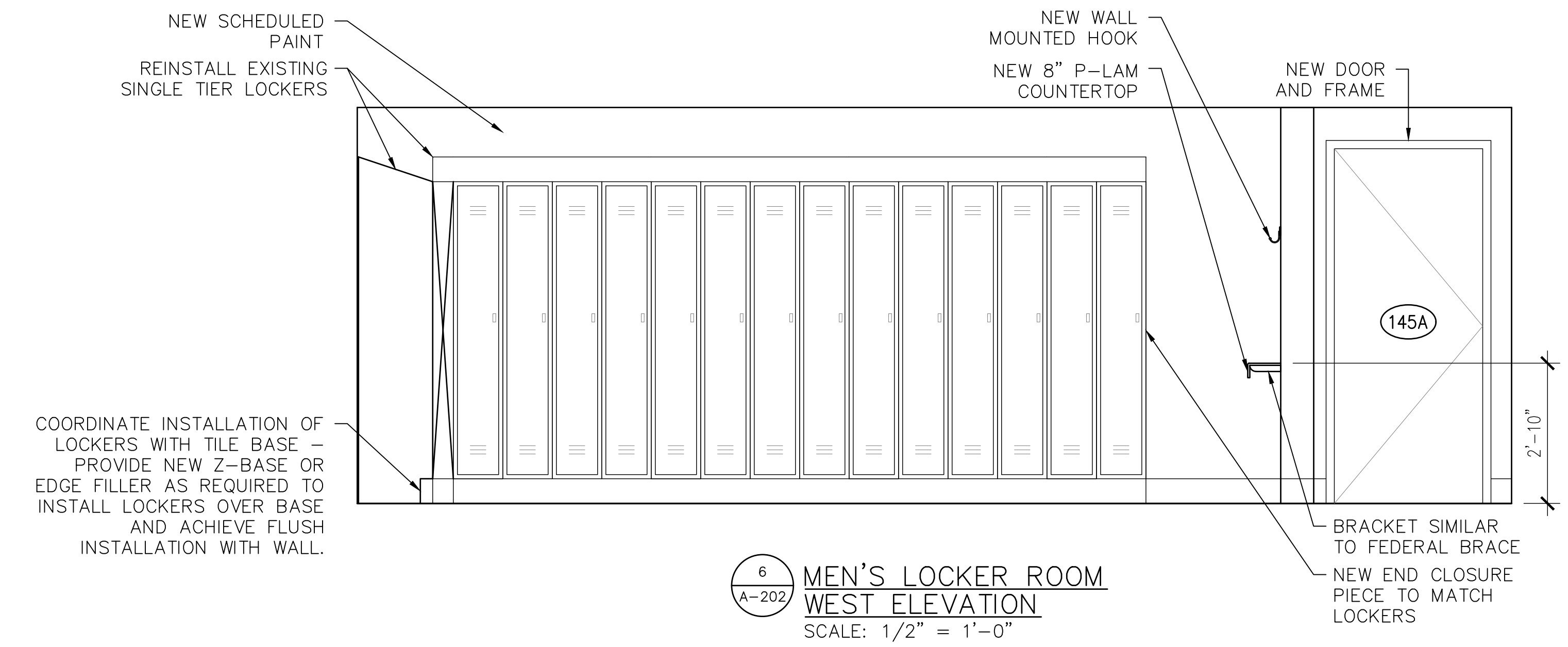
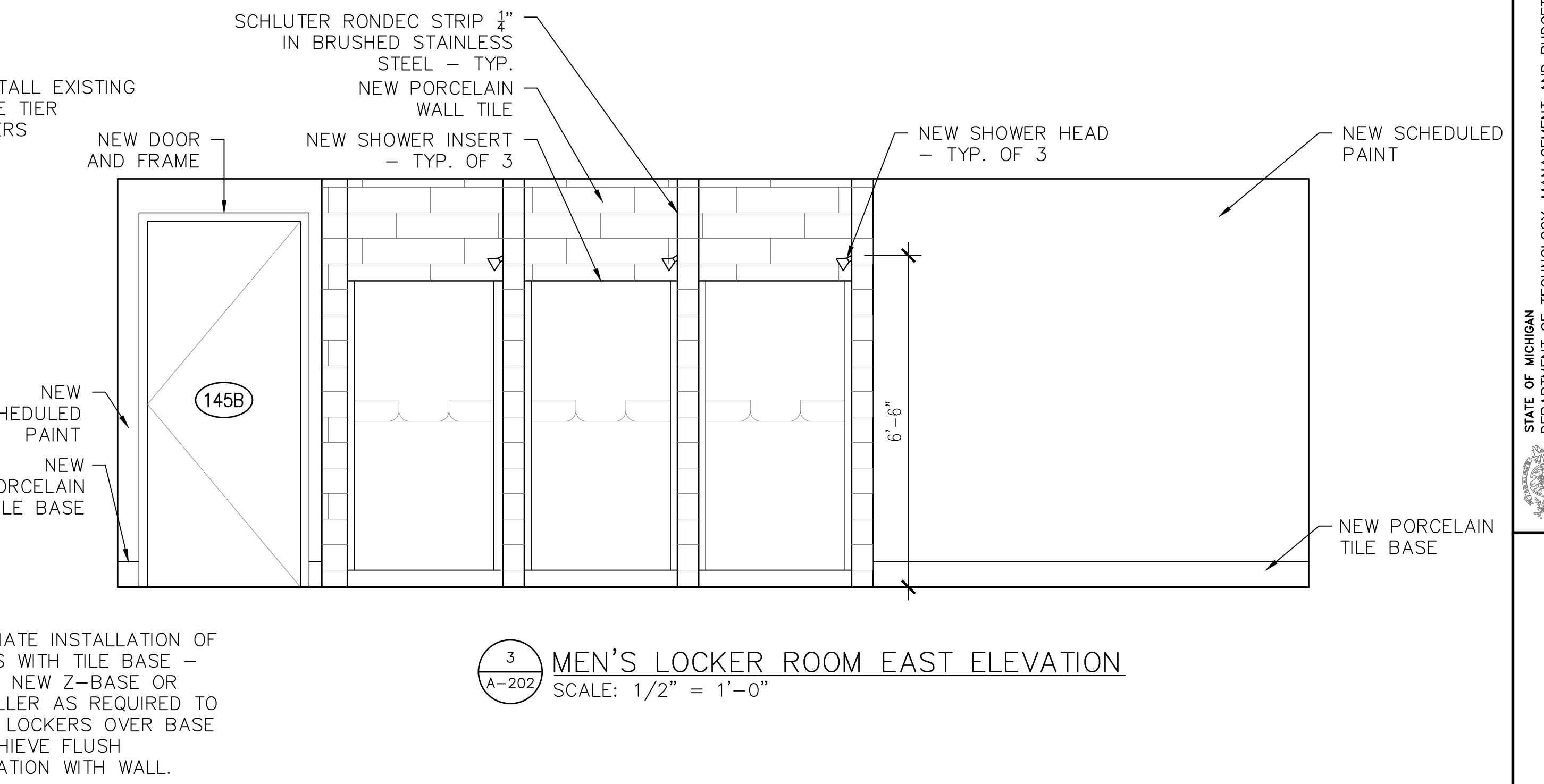
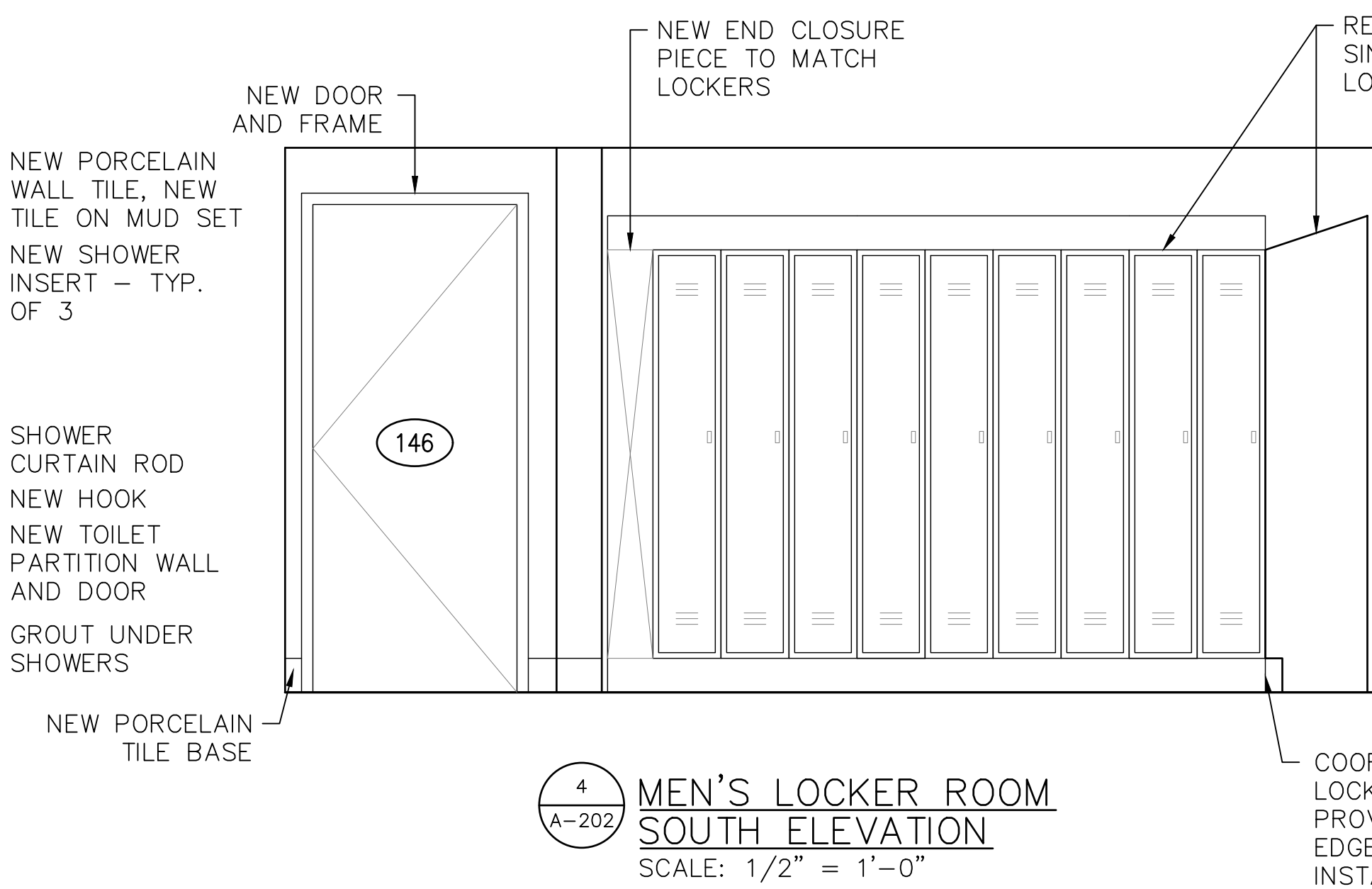
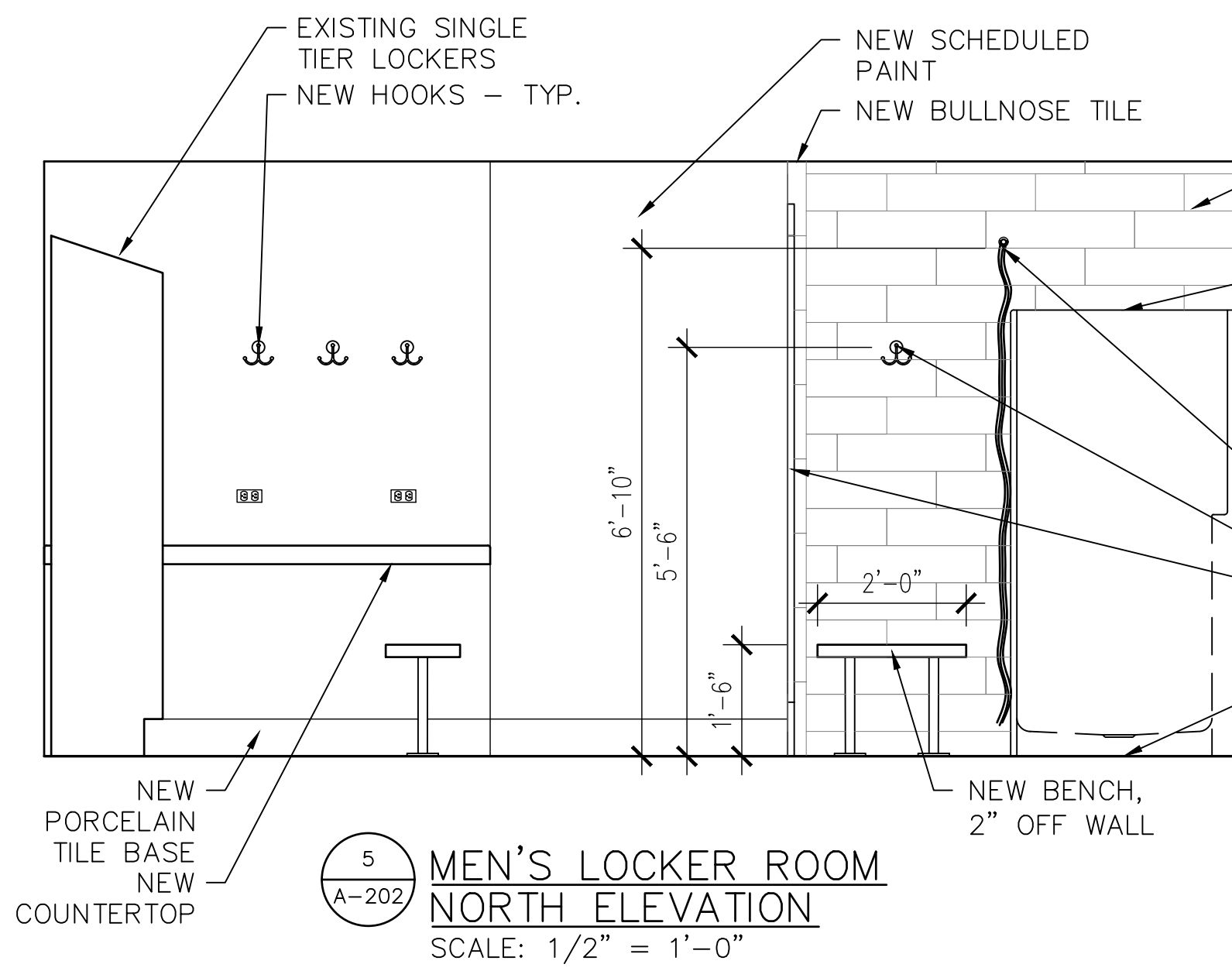


6
A-201
MEN'S LATRINE TOILET PARTITION EAST ELEVATION
SCALE: 1/2" = 1'-0"

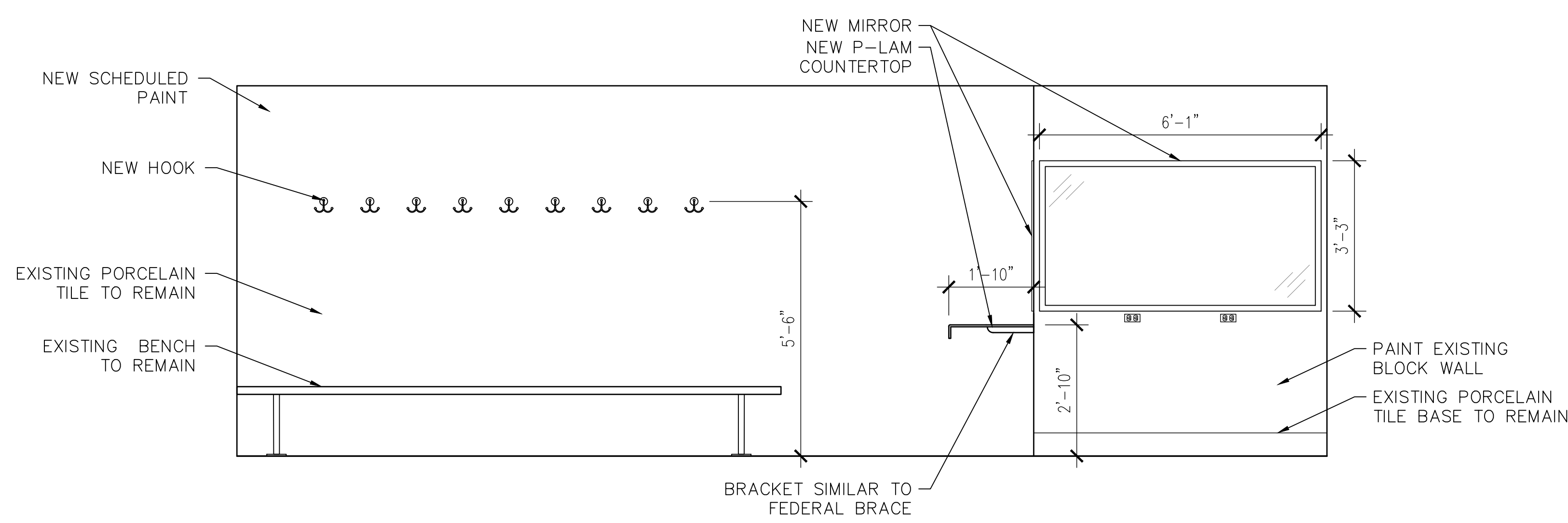


1
A-201
WOMEN'S LATRINE TOILET PARTITIONS WEST ELEVATION
SCALE: 1/2" = 1'-0"

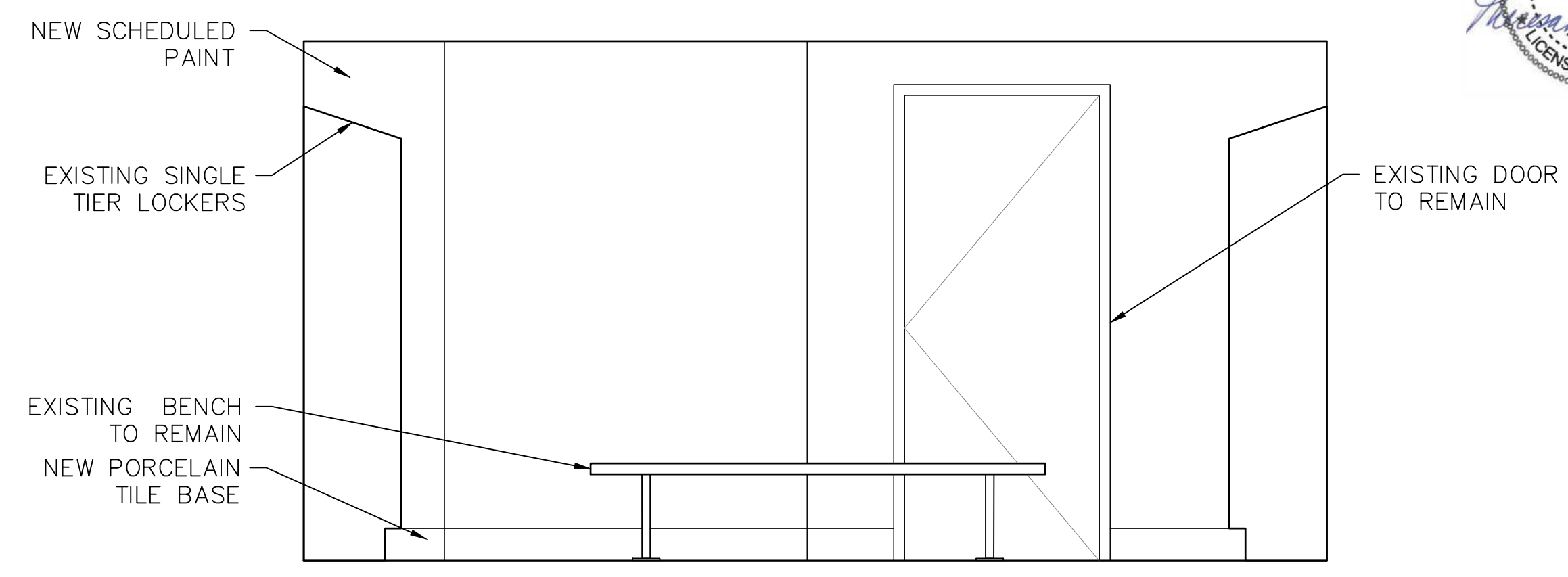




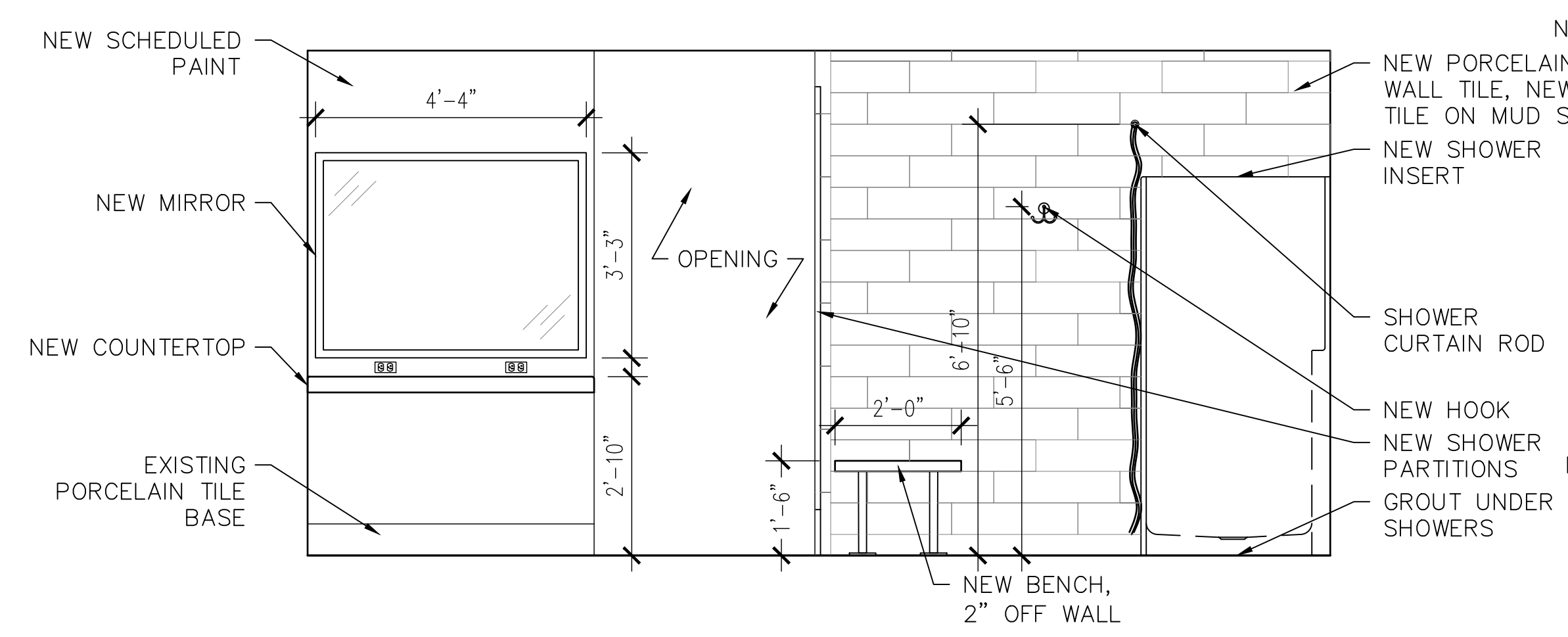
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	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/2126/CAK DMAA PROJECT NO. 2608022016	DRWN TDS	CHECKED TDS	APPROVED T. SCHERWITZ	STATE OF MICHIGAN THERESA DAKIN SCHERWITZ ARCHITECT 301059775 LICENSED ARCHITECT	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR



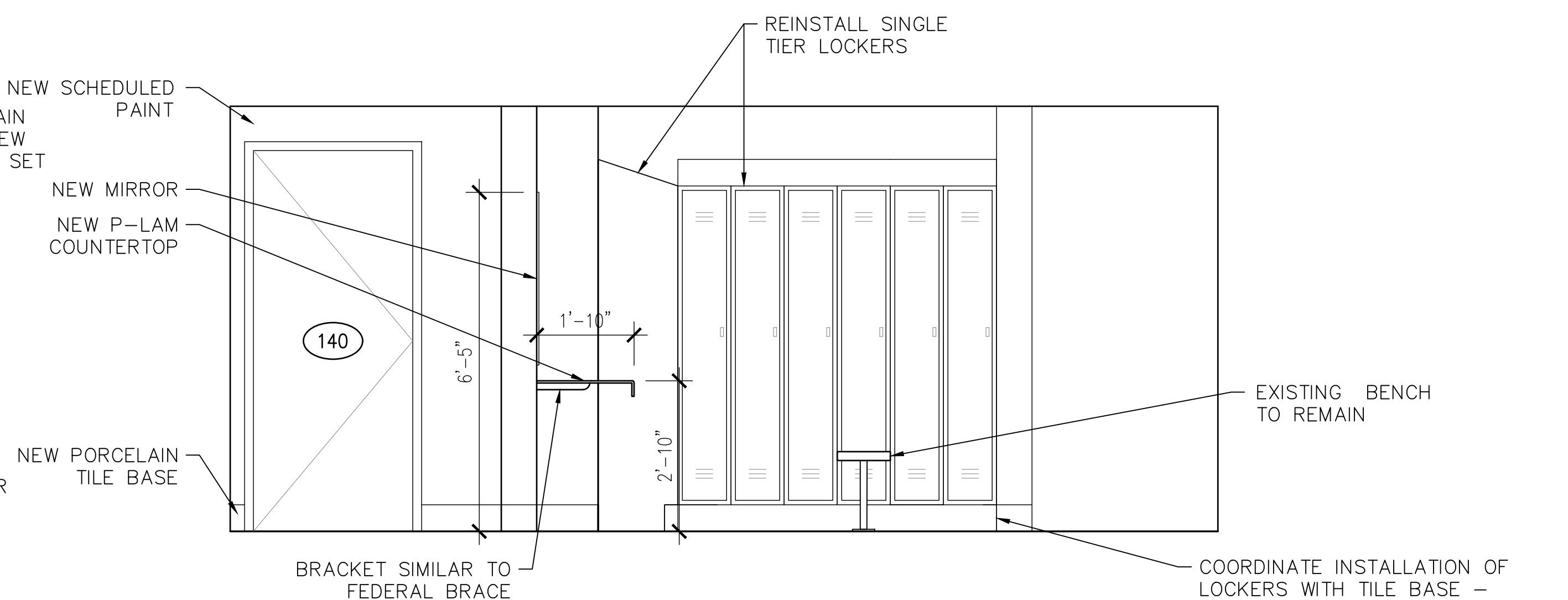
4
A-203
**WOMEN'S SHOWER ROOM
SOUTH ELEVATION**
SCALE: 1/2" = 1'-0"



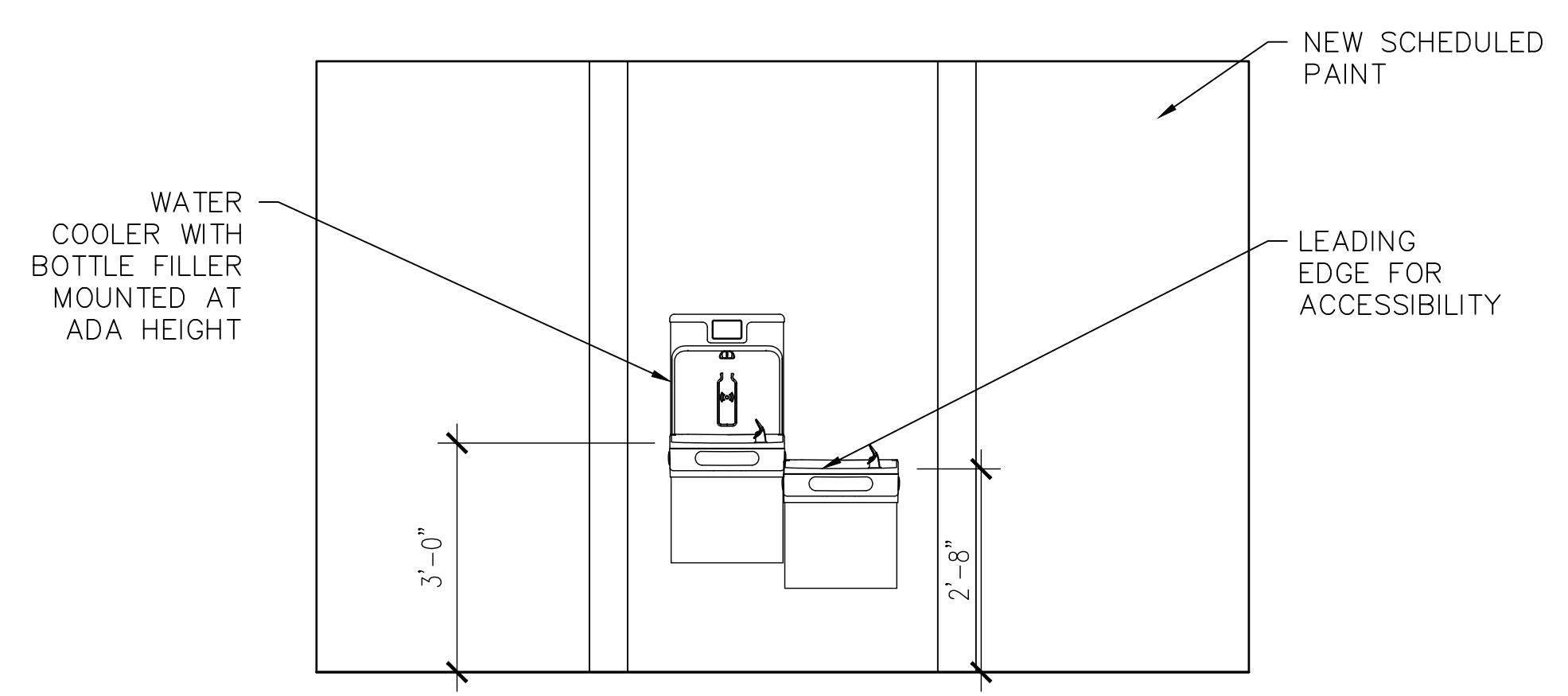
3
A-203
**WOMEN'S LOCKER ROOM
SOUTH ELEVATION**
SCALE: 1/2" = 1'-0"



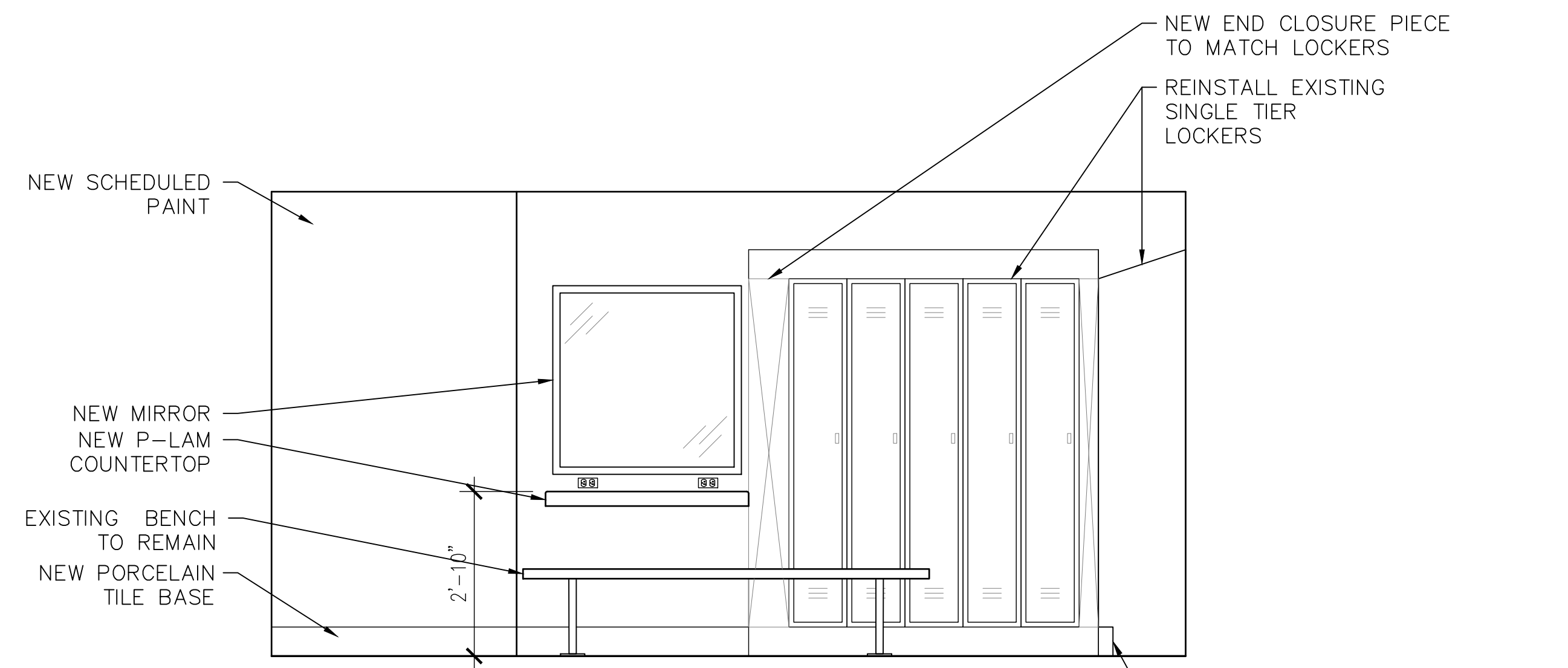
5
A-203
**WOMEN'S SHOWER ROOM
SOUTH ELEVATION**
SCALE: 1/2" = 1'-0"



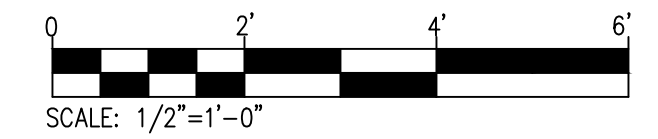
2
A-203
**WOMEN'S LOCKER ROOM
SOUTH ELEVATION**
SCALE: 1/2" = 1'-0"



6
A-203
WATER COOLER NORTH ELEVATION
SCALE: 1/2" = 1'-0"



1
A-203
**WOMEN'S LOCKER ROOM
WEST ELEVATION**



DRAWING NUMBER A-203	DRAWING TITLE NEW TOILET ROOM ELEVATIONS	SHEET NUMBER 39 OF 96	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMY CONTRACT NUMBER: Y21456 FILE NO. 511/21326/CK DWG/A PROJECT NO. 2668022016	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED DT CHECKED TDS APPROVED T. SCHERWITZ	PROJECT RENOVATE ARMY ARMY
	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR THERESA DAKIN SCHERWITZ ARCHITECT 1301059775 LICENSED ARCHITECT 816 E. 4th ST. Royal Oak, MI 48067 248.542.7866 / www.gfrco.com FORBES ARCHITECTS, INC.						



STATE OF MICHIGAN
 DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
 PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
 ADAM P. LACH, RA, DIRECTOR

816 E. 4th ST.
 Royal Oak, MI 48067
 248.542.7866 / www.gfrba.com
FORBES
 ARCHITECTS, P.C.

PROJECT
 RENOVATE ARMORY WASHTEAW
 ARMORY

DESIGNED
 DT
 TDS
 APPROVED T. SCHERWITZ

DATE
 04/01/2022

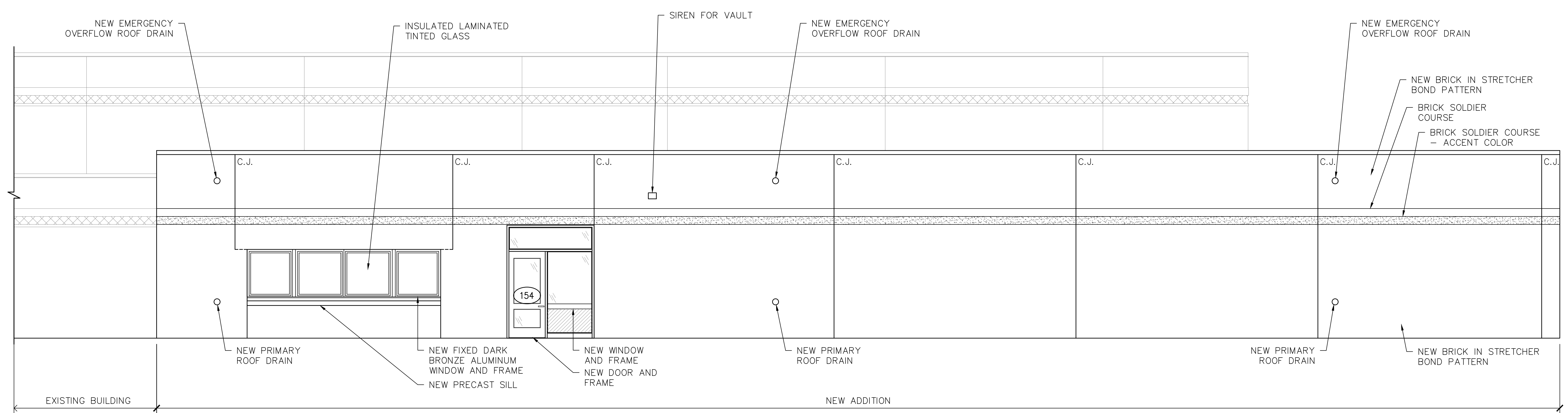
ISSUED FOR
 CONSTRUCTION
 DOCUMENTS

IDENTIFICATION NUMBER
 PROJECT: WASHTEAW ARMORY
 CONTRACT NUMBER: Y21456
 FILE NO. 511/2126/CAK
 DOWIA PROJECT NO. 2662022016

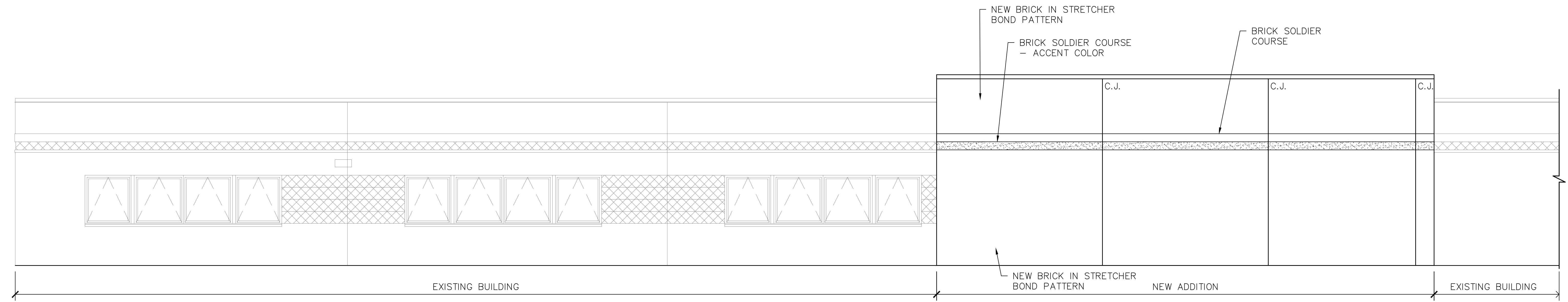
SHEET NUMBER
 40 OF 96

DRAWING TITLE
 NEW EXTERIOR
 ELEVATIONS

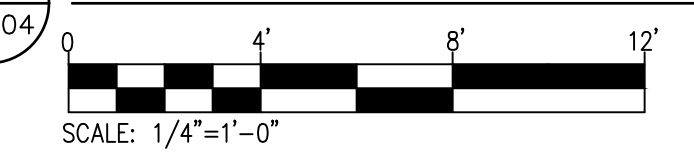
DRAWING NUMBER
A-204

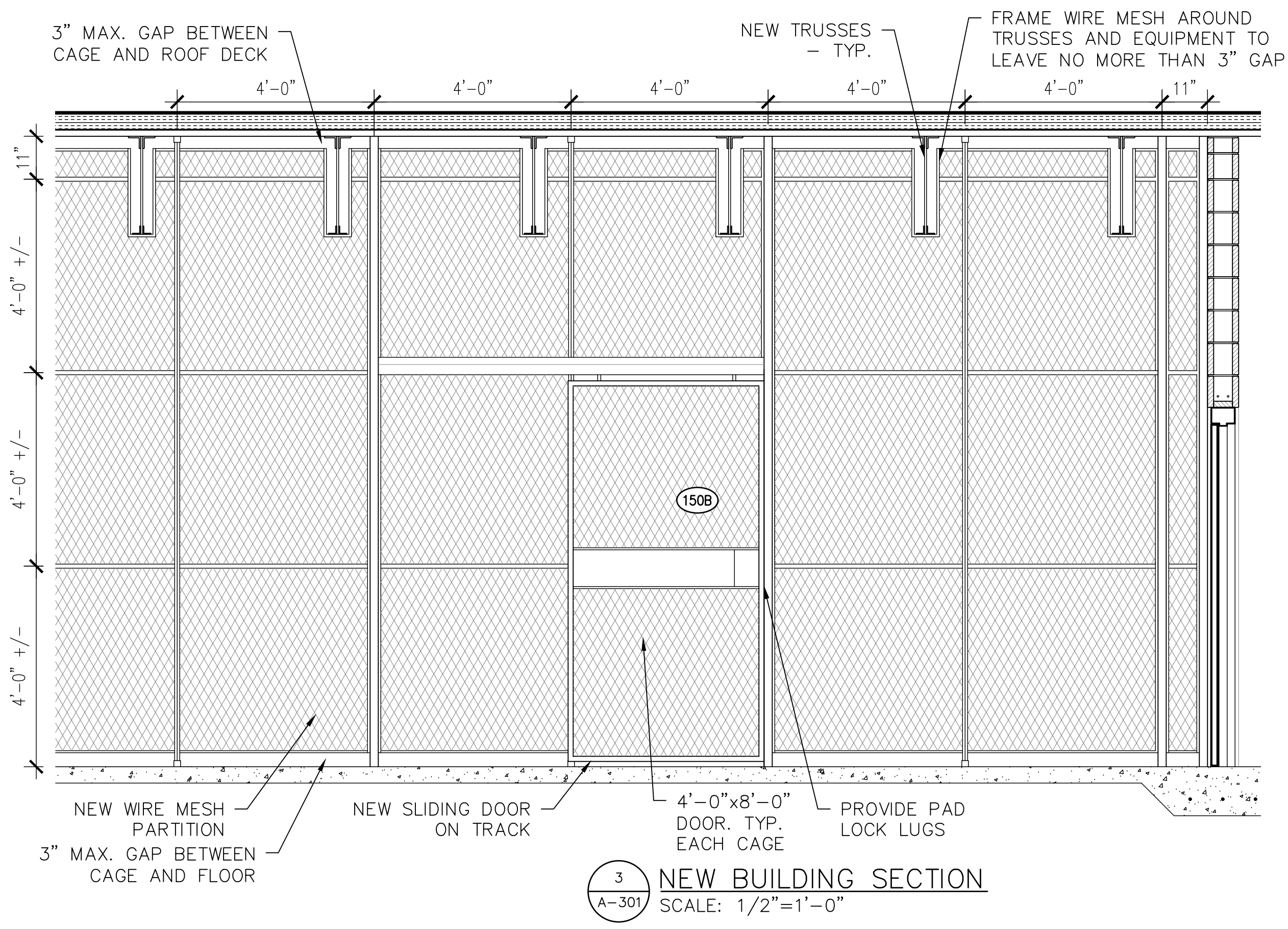


2
 A-204
NEW EXTERIOR WEST ELEVATION
 SCALE: 1/4" = 1'-0"

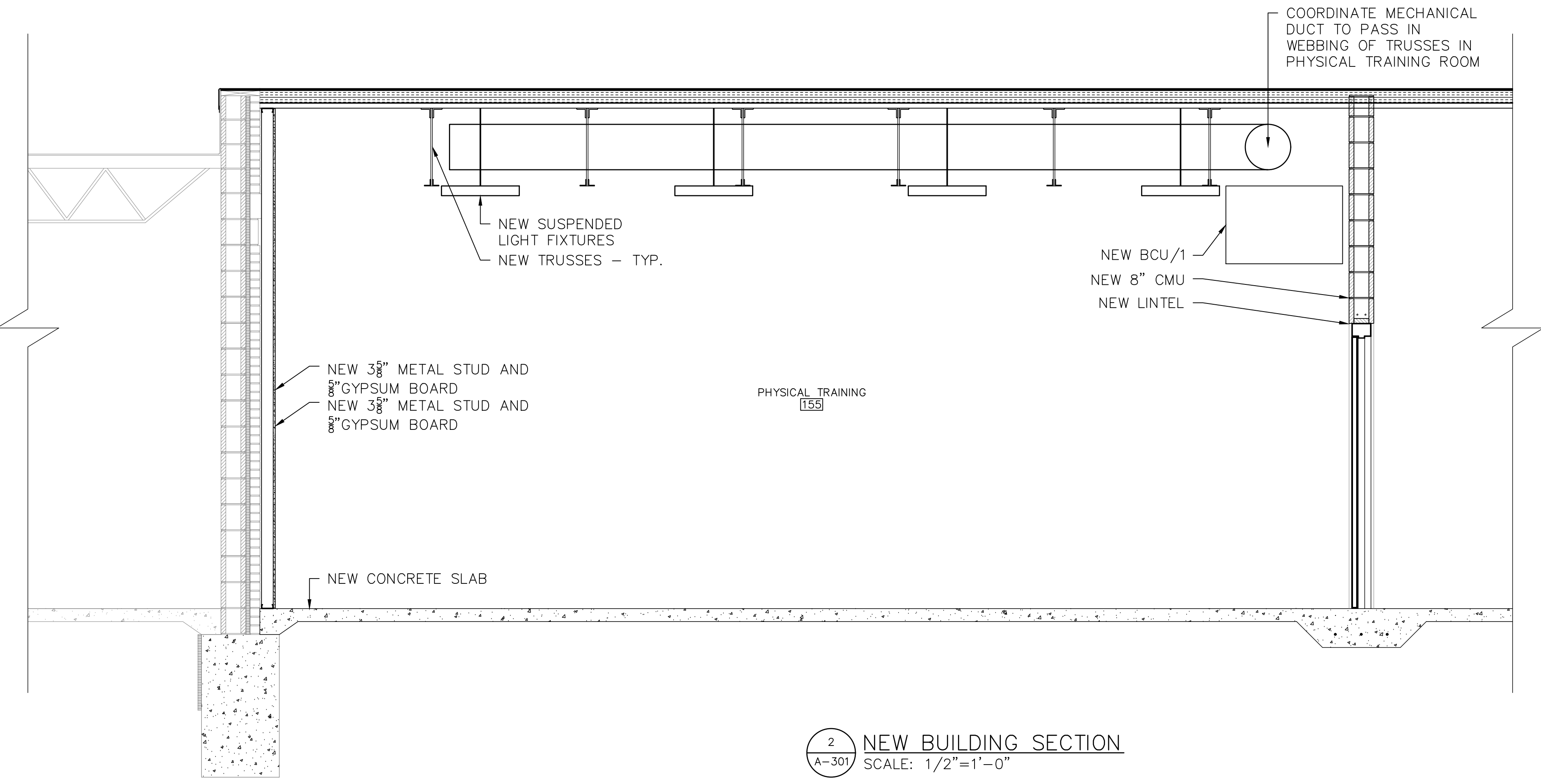


1
 A-204
NEW EXTERIOR SOUTH ELEVATION
 SCALE: 1/4" = 1'-0"

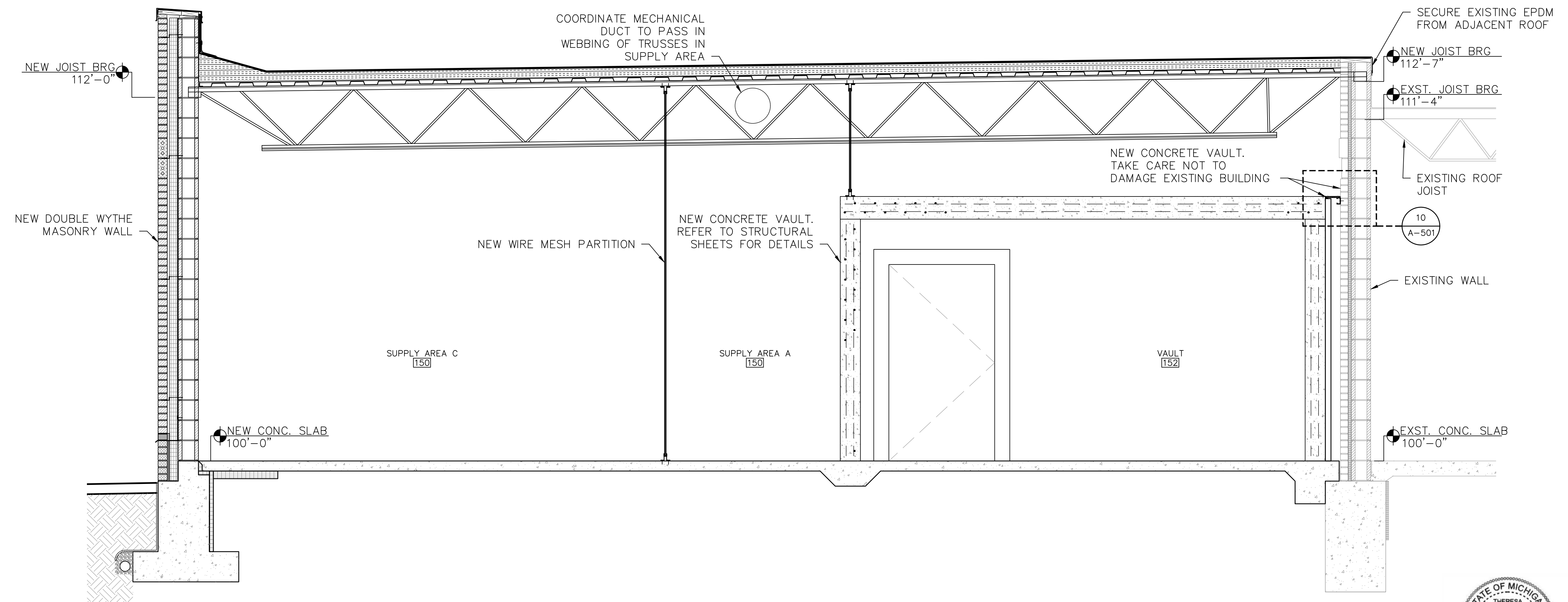




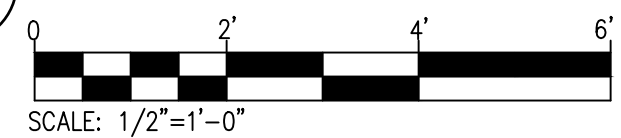
3 NEW BUILDING SECTION
SCALE: 1/2"=1'-0"



2 NEW BUILDING SECTION
SCALE: 1/2"=1'-0"

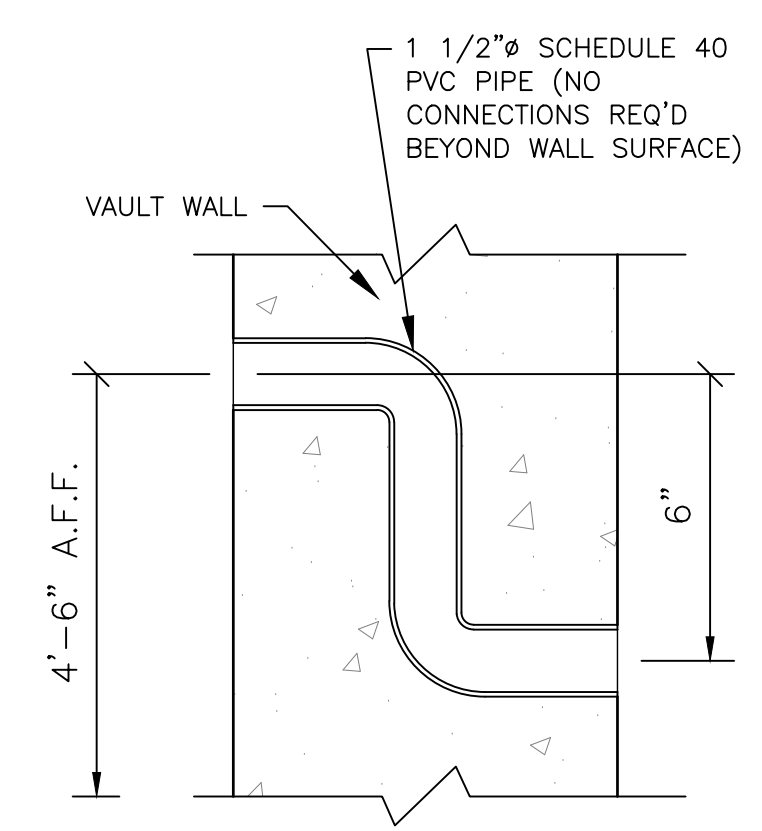


1 NEW BUILDING SECTION
SCALE: 1/2"=1'-0"

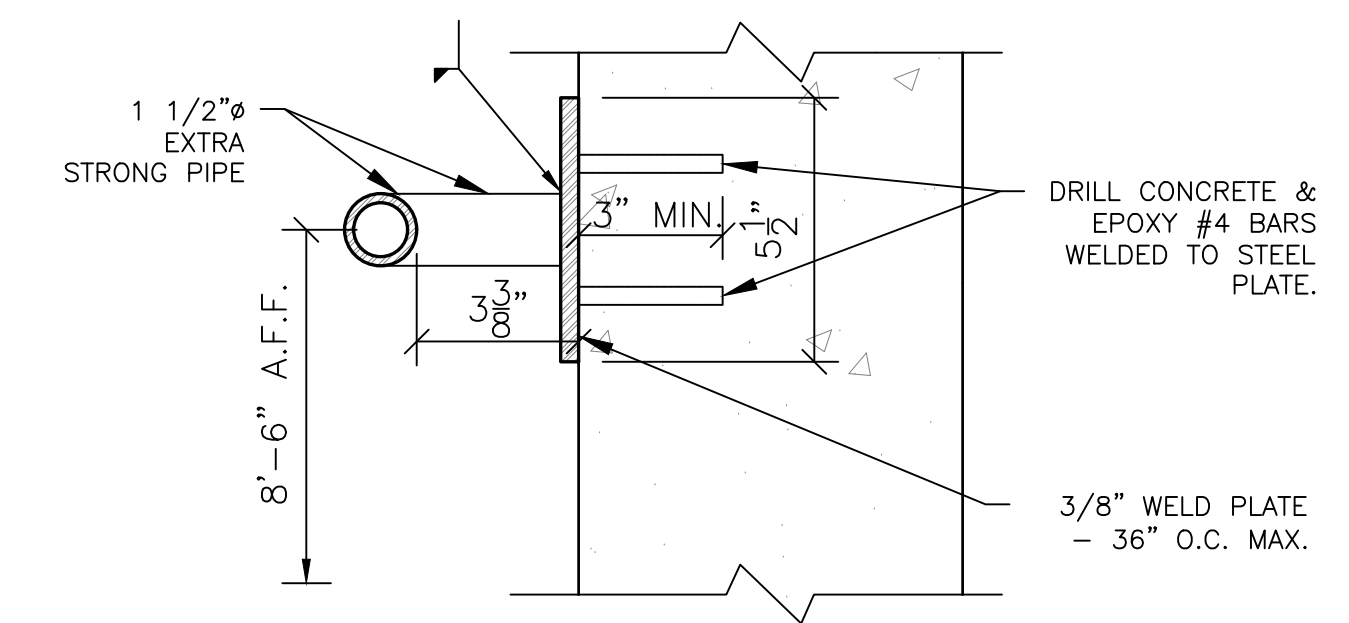


DRAWING NUMBER A-301	DRAWING TITLE NEW TOILET BUILDING SECTIONS	SHEET NUMBER 41 OF 96	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED DT	PROJECT RENOVATE ARMORY WASHTEAW ARMORY
	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/2126/CAK DWG/A PROJECT NO. 2668022016		APPROVED T. SCHERWITZ	DRWN DT	CHECKED TDS	FORBES ARCHITECTS 816 E. 4th ST. Royal Oak, MI 48067 248.542.7866 / www.gfrco.com

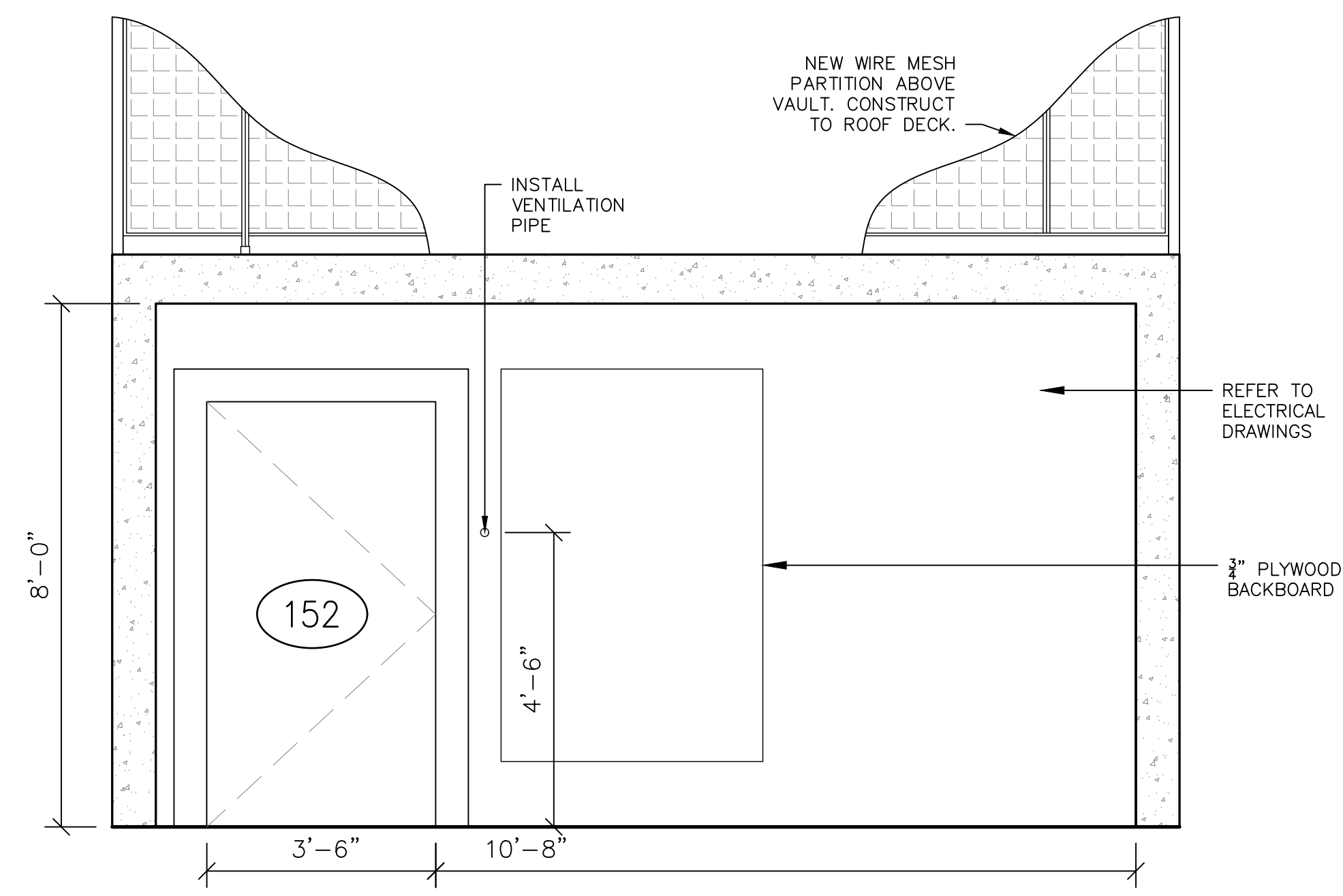
STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR



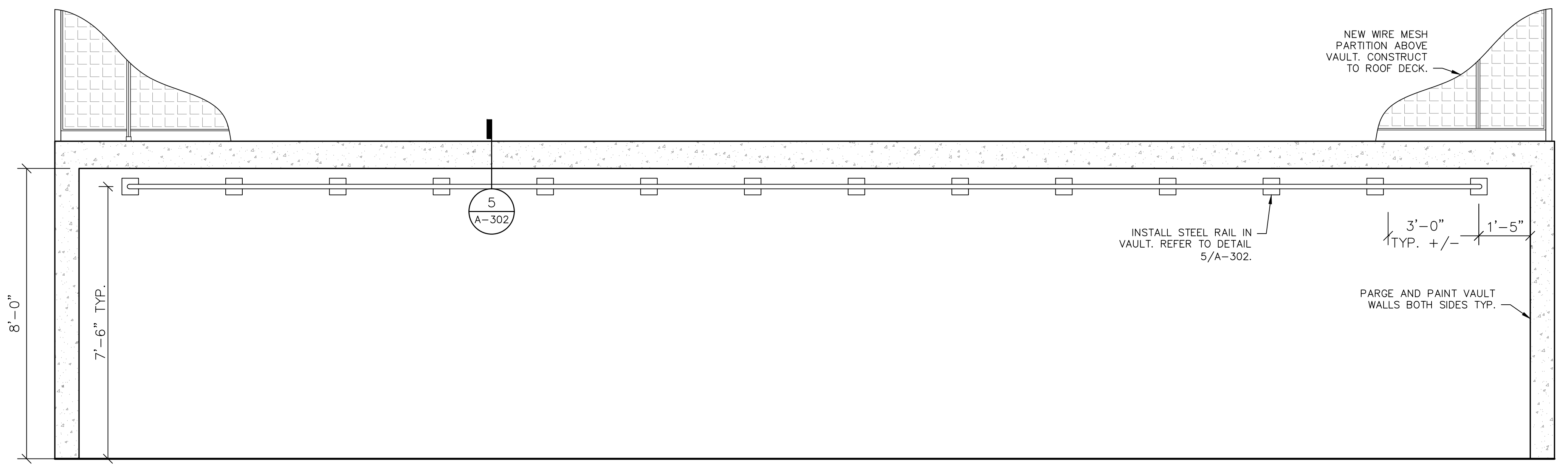
6 VAULT VENTILATION DETAIL
SCALE: 3" = 1'-0"



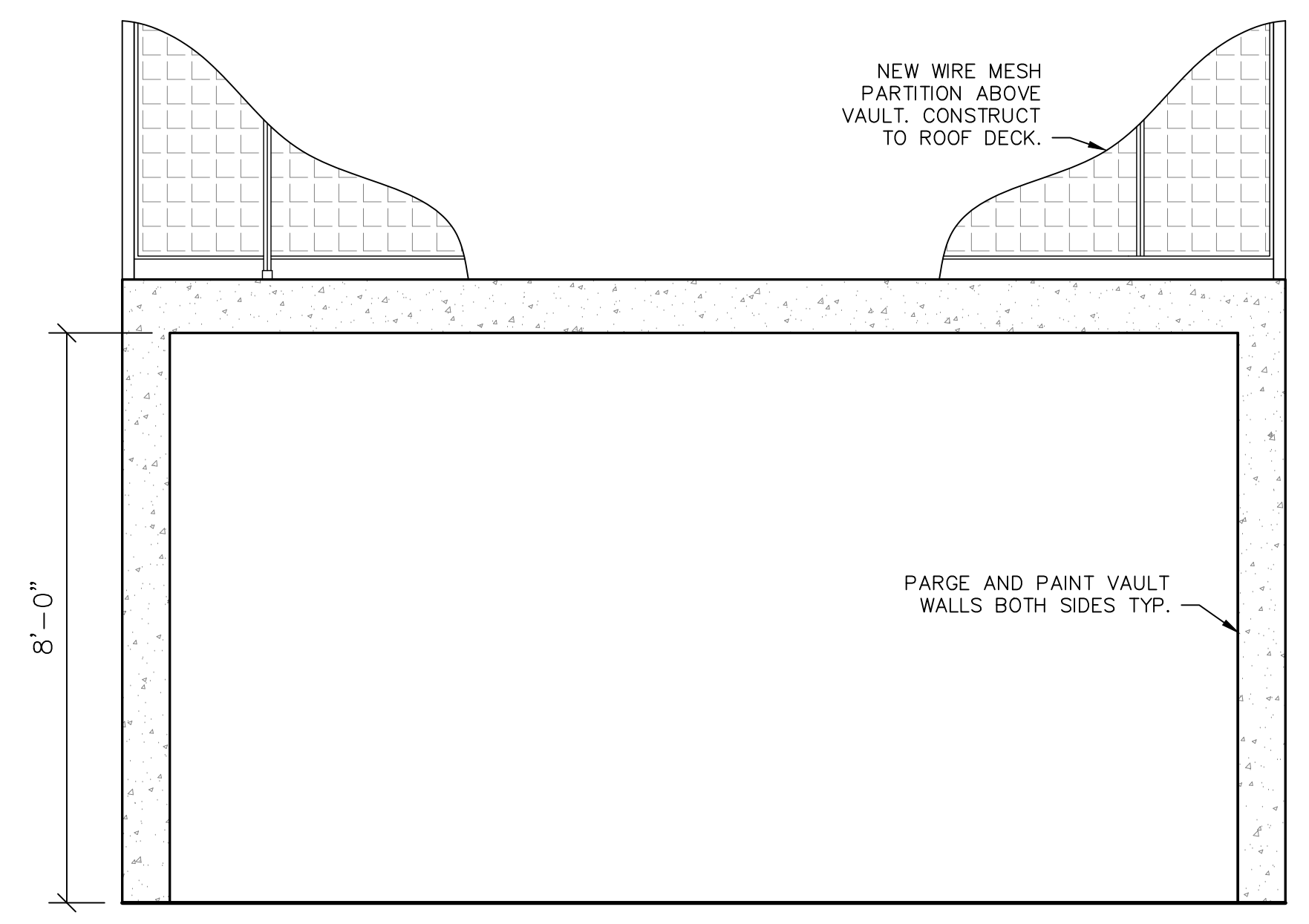
5 RAIL DETAIL AT VAULT
SCALE: 3" = 1'-0"



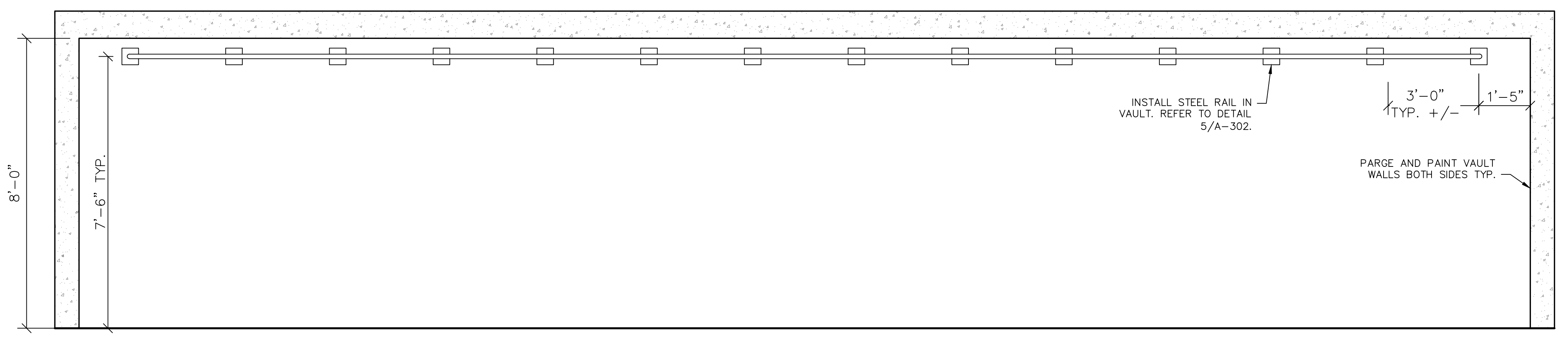
4 VAULT NORTH SECTION
SCALE: 1/2" = 1'-0"



3 VAULT WEST SECTION
SCALE: 1/2" = 1'-0"



2 VAULT SOUTH SECTION
SCALE: 1/2" = 1'-0"



1 VAULT EAST SECTION
SCALE: 1/2" = 1'-0"

DRAWING NUMBER A-302	DRAWING TITLE NEW VAULT SECTIONS	SHEET NUMBER 42 OF 96	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMYORY CONTRACT NUMBER: Y21456 FILE NO. 511/2126/CAK DWG/A PROJECT NO. 2668022016	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED DT TDS APPROVED: T. SCHERWITZ	PROJECT RENOVATE ARMYORY WASHTEAW ARMYORY	 816 E. 4th St. Royal Oak, MI 48067 248.542.7866 / www.gfrco.com	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR
	Theresa Dakin Scherwitz ARCHITECT 1301059775 LICENSED ARCHITECT								



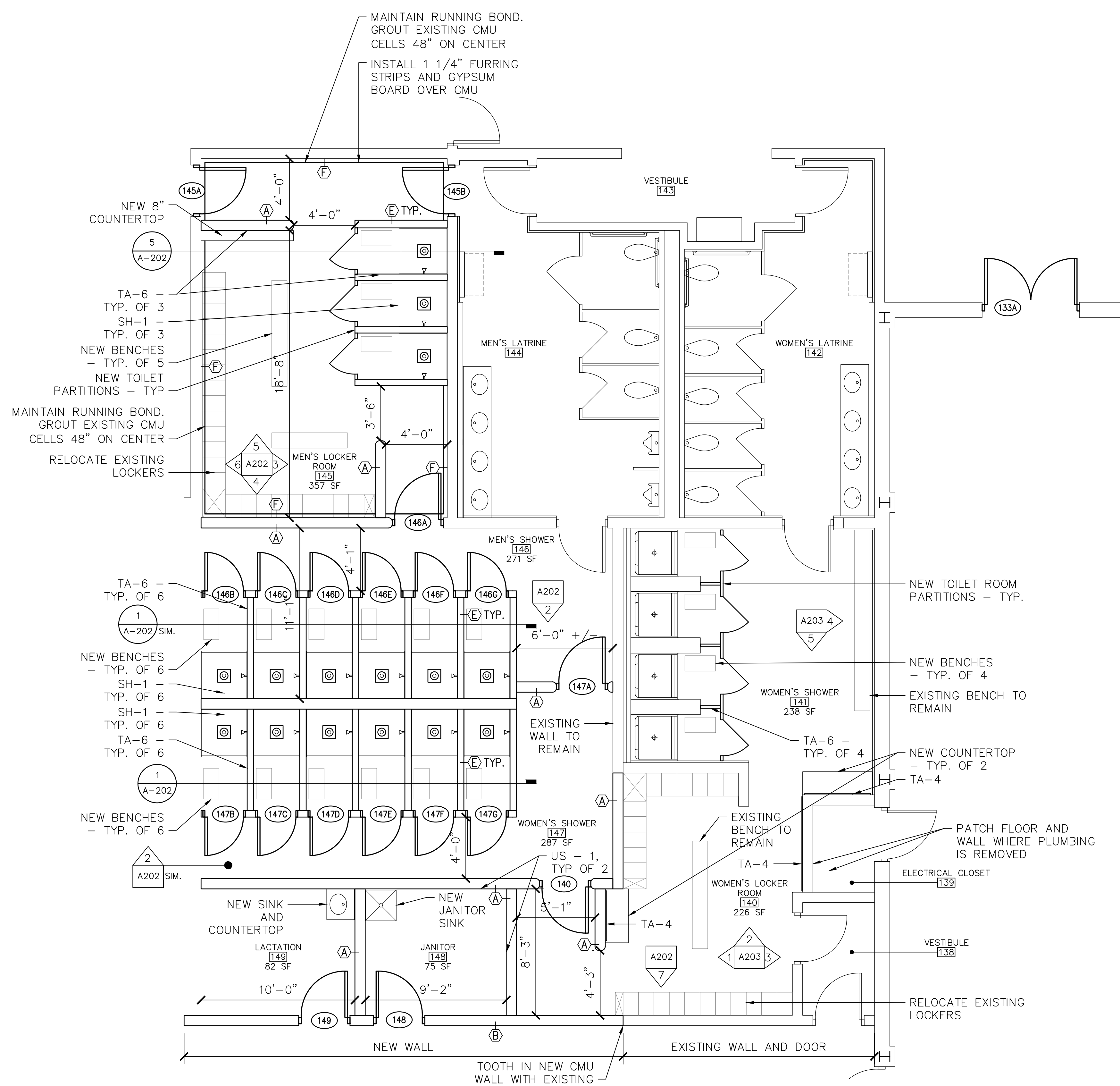
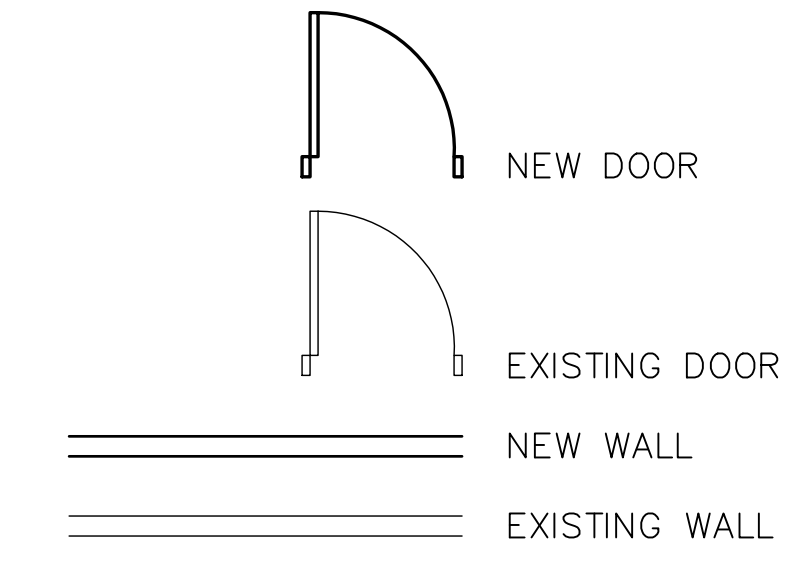
TAG	DESCRIPTION	MANUFACTURER/ MODEL NUMBER
TA-1	THROUGH-MOUNTED TOILET TISSUE DISPENSER	BOBRICK B-386
TA-2	SURFACE MOUNTED PAPER TOWEL DISPENSER	BOBRICK B-262
TA-3	SURFACE-MOUNTED SOAP DISPENSER	GOJO #34088
TA-4	MIRROR	AMERICAN SPECIALTIES MODEL 8287
TA-5	OVERHEAD BRACED RESTROOM PARTITION	BRADLEY SERIES 400
TA-6	ROBE HOOK	BRADLEY #9124
WC-1	WALL MOUNTED WATER CLOSET	REFER TO MECHANICAL
HD-1	WALL MOUNTED ELECTRIC HAND DRYER WITH RECESS KIT	WORLD DRYER AIRFORCE J-973 W/ KJR-973K-1
LAV-1	OMNIDECK COUNTER WITH 2 INTEGRATED OVAL BOWL LAVS	BRADLEY #LD-3010-3-BOWL
UR-1	URINAL	REFER TO MECHANICAL
US-1	UTILITY SHELF	BRADLEY 9933
SH-1	FIBERGLASS SHOWER INSERT	OASIS SH-3636

NOTE: BRANDS AND MODEL NUMBERS ABOVE ARE BASIS OF DESIGN. EQUAL PRODUCTS WITH THE SAME CHARACTERISTICS, DIMENSIONS, MATERIALS, AND CONSTRUCTION WILL BE ACCEPTED.

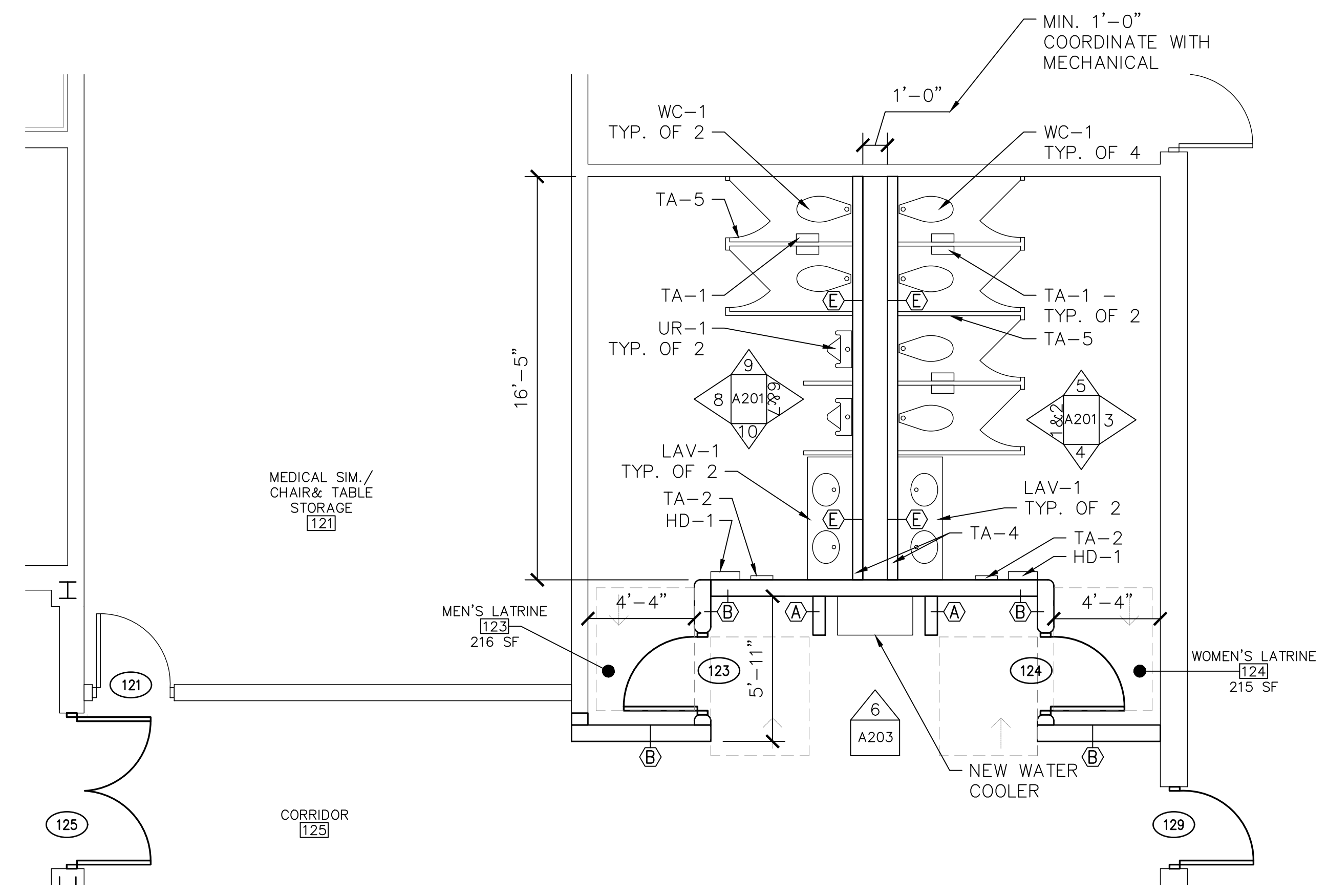
WALL TYPES:

- (A) 8" CMU WALL TO ABOVE CEILING
- (B) 8" CMU WALL TO DECK
- (C) 4" CMU WALL TO ABOVE CEILING
- (D) POURED CONCRETE VAULT WALL
- (E) TYPICAL LIGHT FRAMED METAL STUD WALL ABOVE CEILING
- (F) GYP BD AND 1-1/4" FURRING STRIPS ON EXISTING WALL
- (G) WIRE MESH PARTITION
- (H) EXTERIOR DOUBLE WYTHE MASONRY WALL

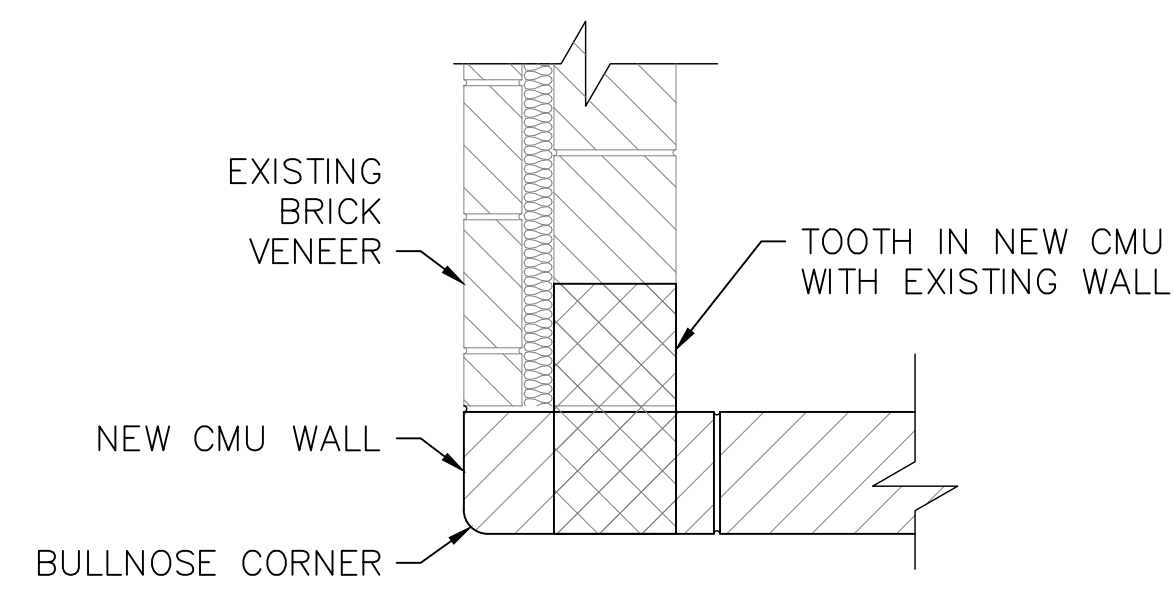
LEGEND:



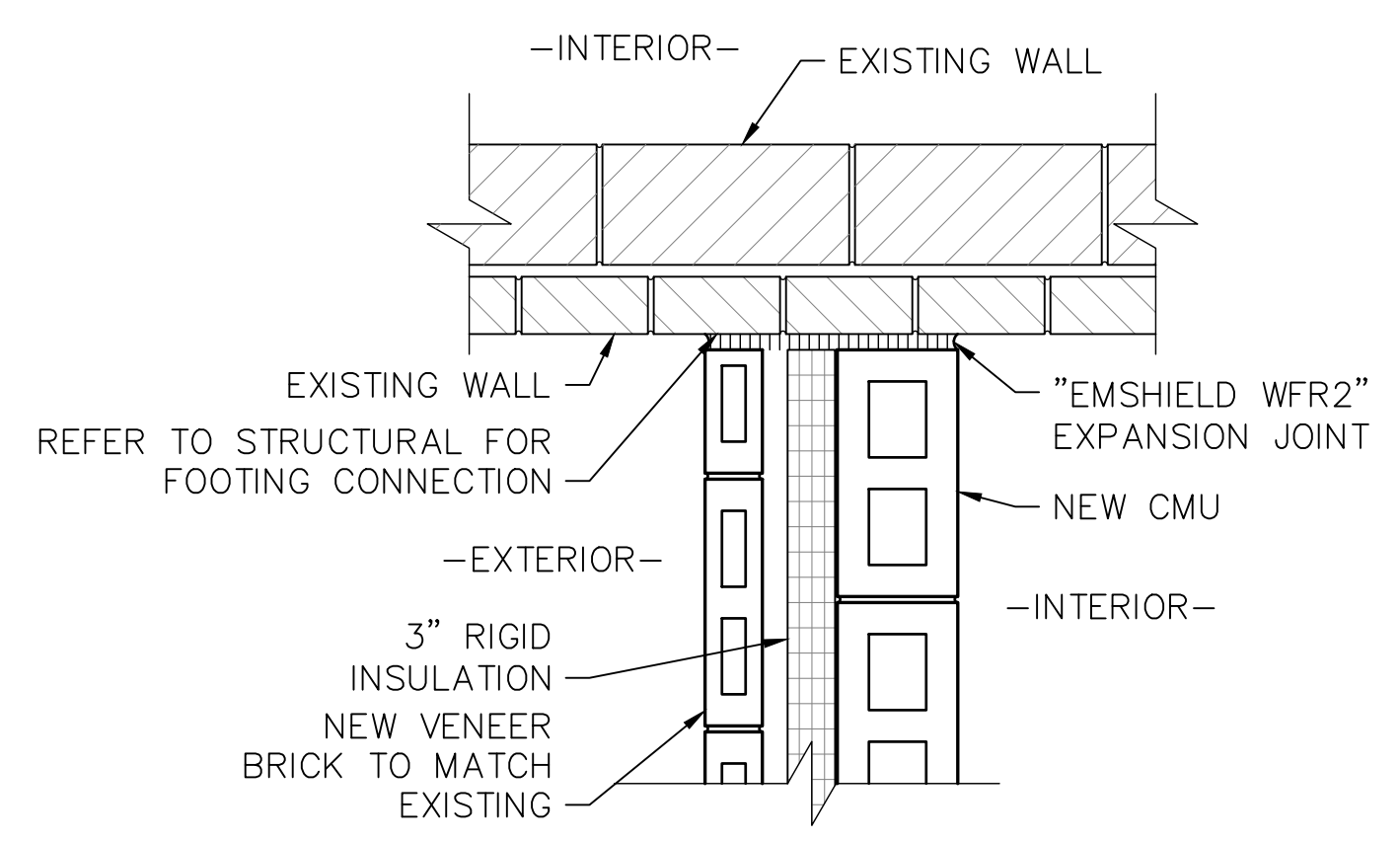
1
 A-401
ENLARGED RESTROOMS, SHOWERS, AND LOCKER ROOMS
 SCALE: 1/4"=1'-0"



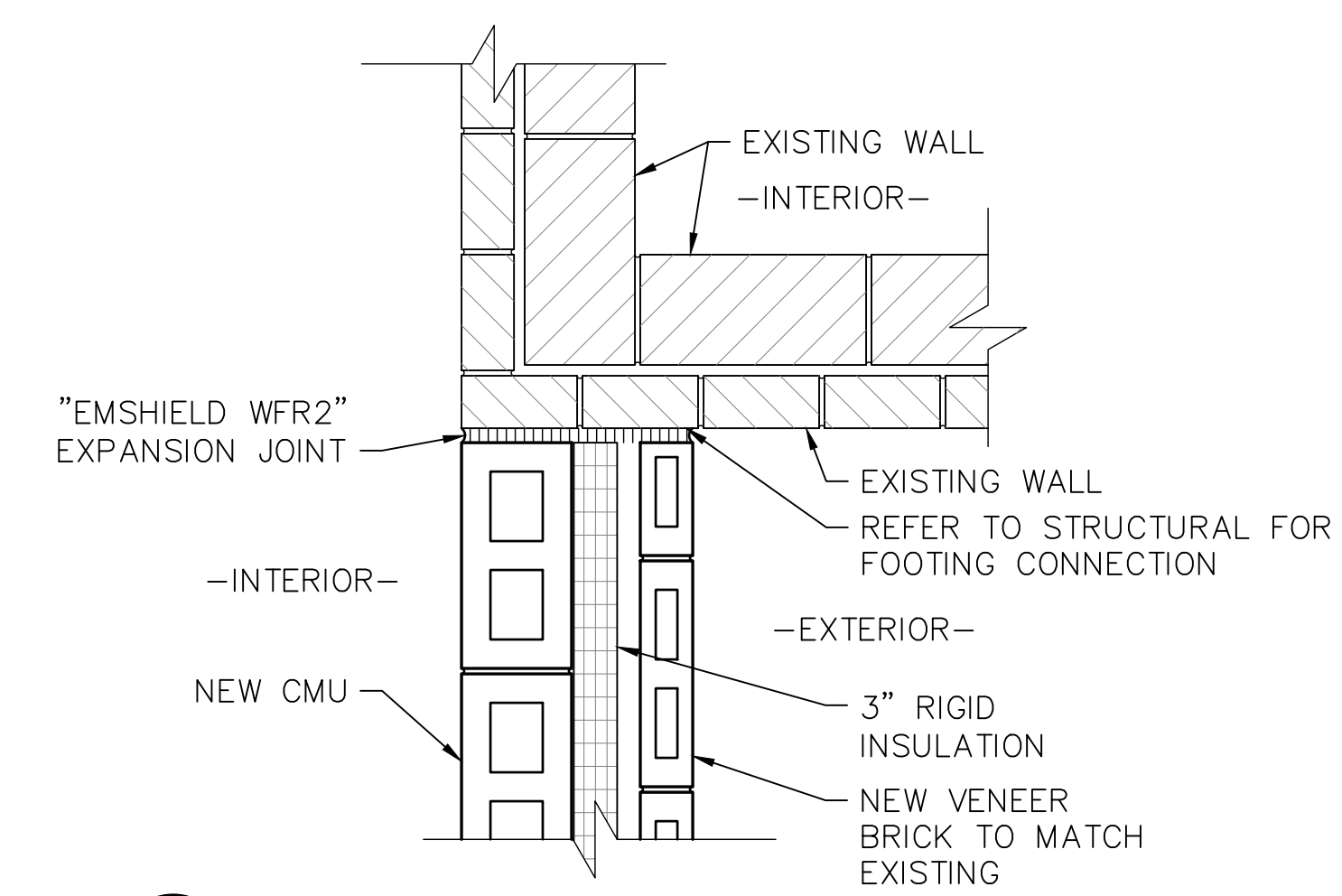
2
 A-401
ENLARGED RESTROOMS
 SCALE: 1/4"=1'-0"



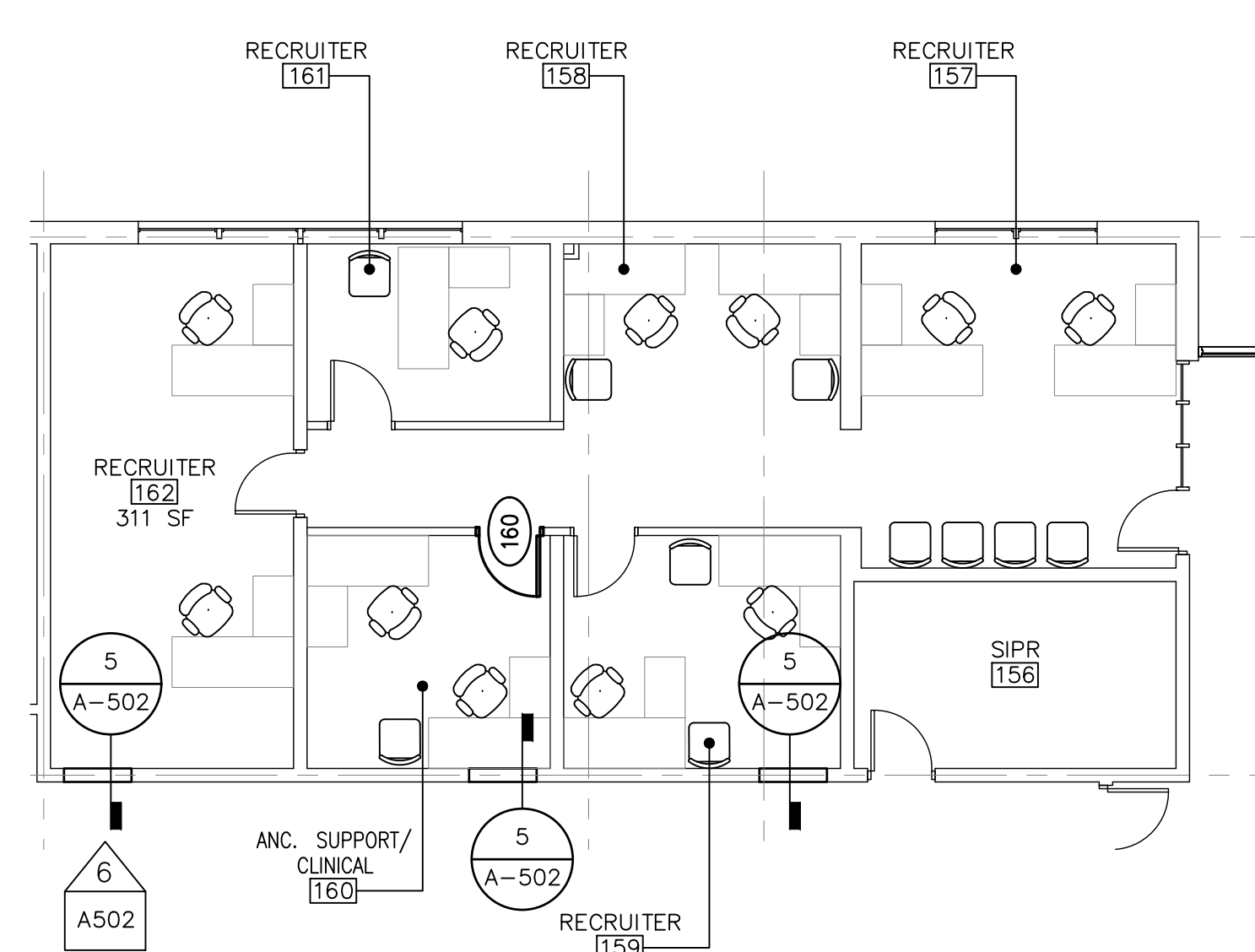
5
 A-402
 ENLARGED CORNER
 IN CORRIDOR 153
 SCALE: 1"=1'-0"



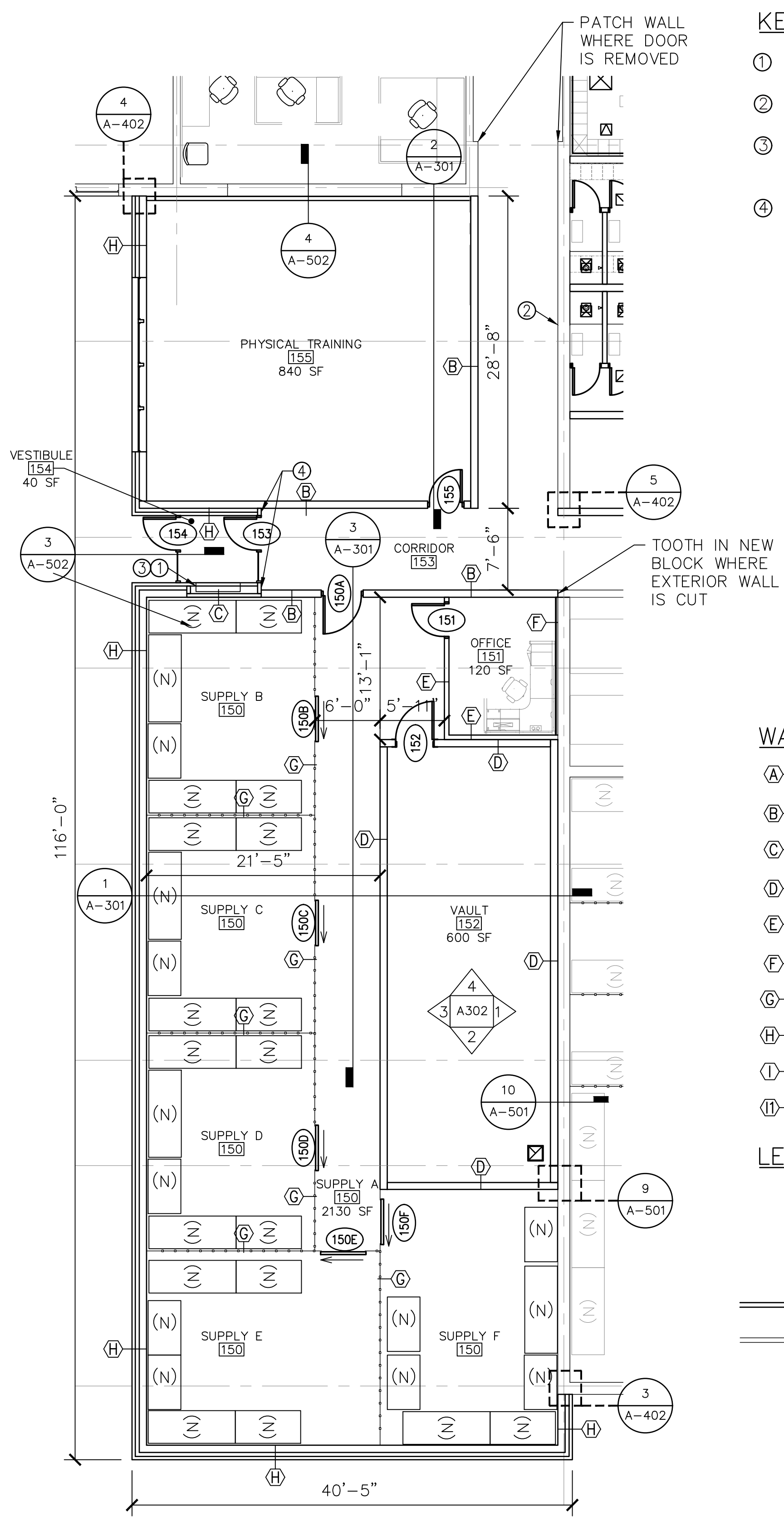
4
 A-402
 EXPANSION JOINT DETAIL AT NEW
 WALL AND EXISTING WALL
 SCALE: 1"=1'-0"



3
 A-402
 EXPANSION JOINT DETAIL AT NEW
 WALL AND EXISTING WALL
 SCALE: 1"=1'-0"



1
 A-402
 ENLARGED RECRUITING OFFICES
 SCALE: 1/8"=1'-0"



2
 A-402
 ENLARGED SUPPLY, VAULT, AND
 PHYSICAL TRAINING ROOM
 SCALE: 1/8"=1'-0"

KEY NOTES:

- ① NEW CABINET HEATER. REFER TO MECHANICAL.
- ② EXISTING BRICK VENEER TO REMAIN EXPOSED
- ③ CONTINUE BRICK VENEER AND INSULATION INTO VESTIBULE. RECESS CUH IN BRICK VENEER AND 4" CMU CAVITY WALL.
- ④ BRICK VENEER RETURN

WALL TYPES:

- Ⓐ- 8" CMU WALL TO ABOVE CEILING
- Ⓑ- 8" CMU WALL TO DECK
- Ⓒ- 4" CMU WALL TO ABOVE CEILING
- Ⓓ- POURED CONCRETE VAULT WALL
- Ⓔ- 5" LIGHT FRAMED METAL STUD WALL ABOVE CEILING
- Ⓕ- GYP BD AND FURRING STRIPS ON EXISTING WALL
- Ⓖ- WIRE MESH PARTITION
- Ⓗ- EXTERIOR DOUBLE WYTHE MASONRY WALL
- Ⓘ- 4" CMU WALL TO ABOVE CEILING
- Ⓜ- 4" SOLID BLOCK WALL TO DECK





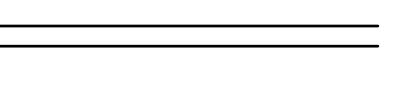
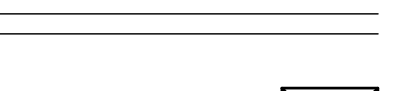
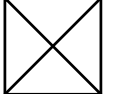


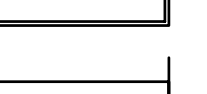

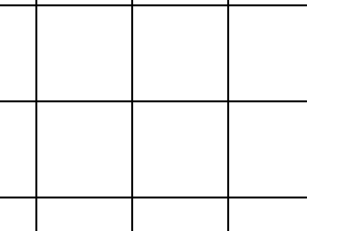

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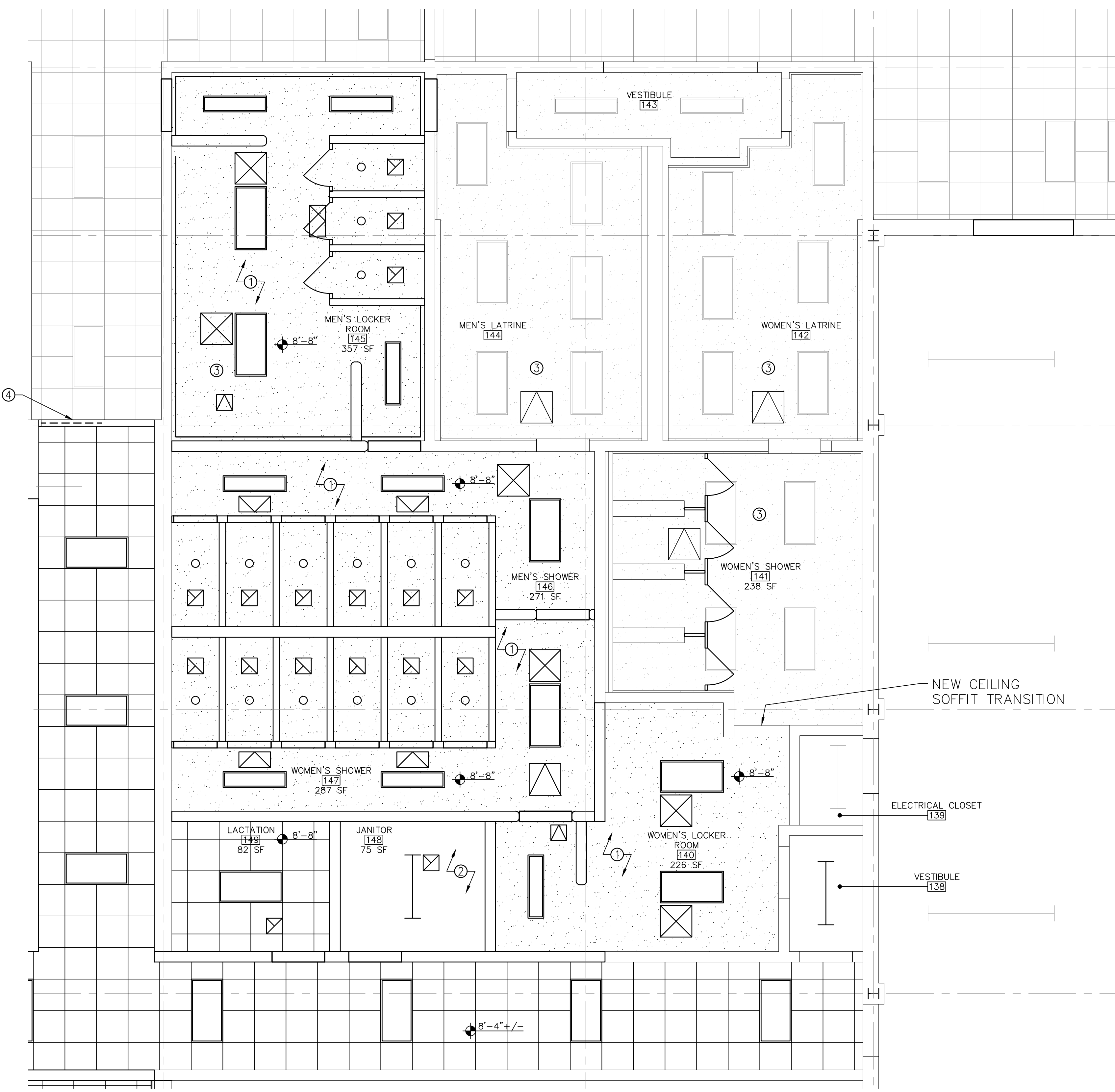
- NEW DOOR
- EXISTING DOOR
- NEW WALL
- EXISTING WALL

KEY NOTES:

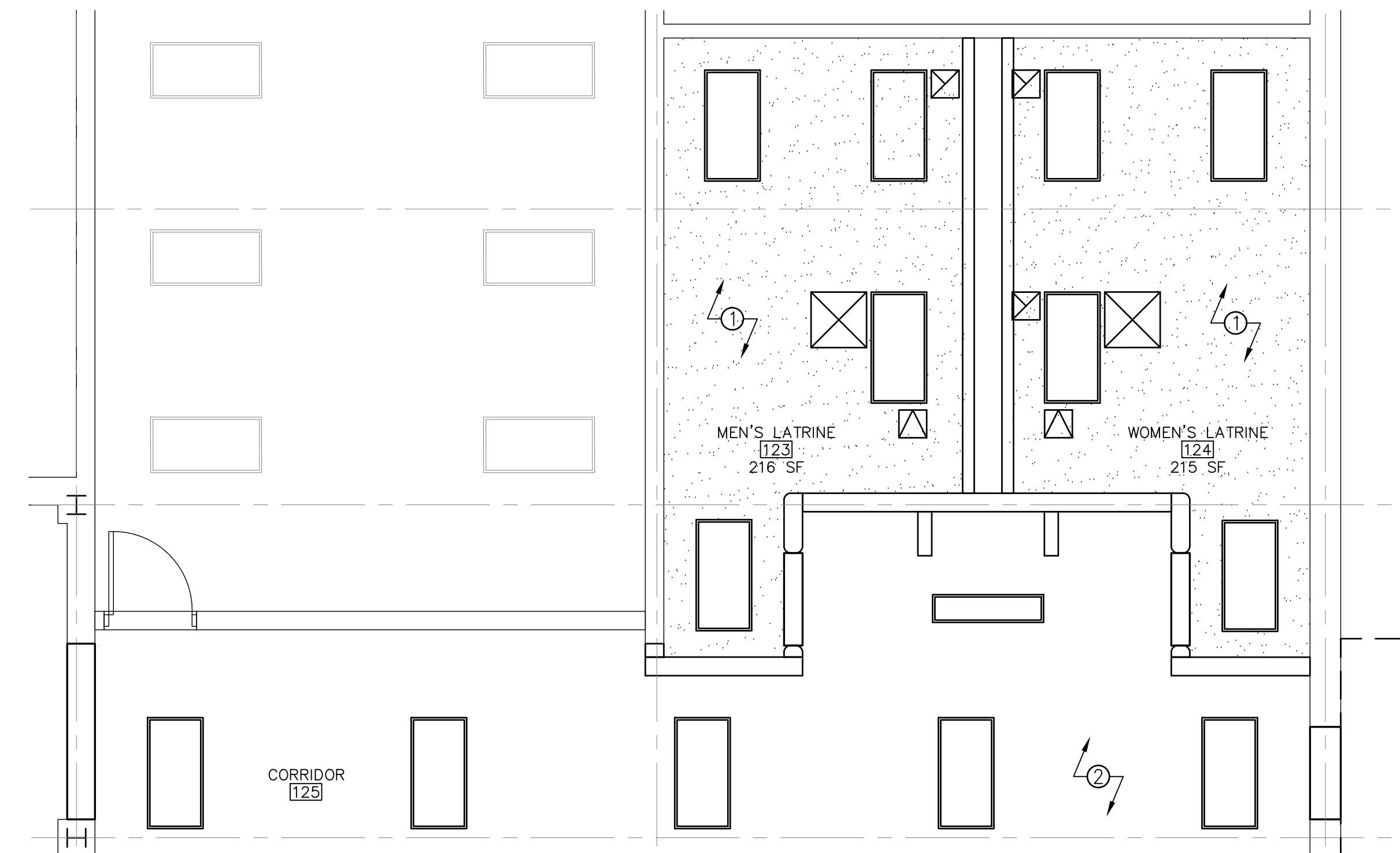
- ① NEW PAINTED GYPSUM BOARD CEILING
- ② CEILING OPEN TO STRUCTURE – PAINT STRUCTURE
- ③ CUT AND PATCH WALL/CEILING INSTALLATION FOR NEW FIRE SPRINKLER/MECHANICAL DEMO AND NEW WORK. CONTRACTOR TO COORDINATE. REFER TO MECHANICAL.
- ④ NEW GYPSUM BOARD SOFFIT AT CEILING TRANSITION

LEGEND:

-  EXISTING LIGHT FIXTURES
-  EXISTING GYPSUM BOARD CEILING
-  NEW 24"X 48" LIGHT FIXTURE
-  NEW GYPSUM BOARD CEILING
-  NEW WALL
-  EXISTING WALL
-  NEW HVAC SUPPLY
-  NEW HVAC EXHAUST GRILLE
-  NEW ACCESS PANEL. COORDINATE WITH MECHANICAL.
- NEW DOWN LIGHT
-  NEW 12"X 48" LIGHT FIXTURE
-  NEW SURFACE MOUNTED DROP FIXTURE
-  NEW 2'X2' ACOUSTICAL CEILING AND GRID
-  EXISTING 2'X2' ACOUSTICAL CEILING AND GRID



1
 A-403
 ENLARGED RESTROOMS, SHOWERS, AND
 LOCKER ROOMS
 SCALE: 1/4"=1'-0"



2
 A-403
 ENLARGED RESTROOMS
 REFLECTED CEILING PLAN
 SCALE: 1/4"=1'-0"



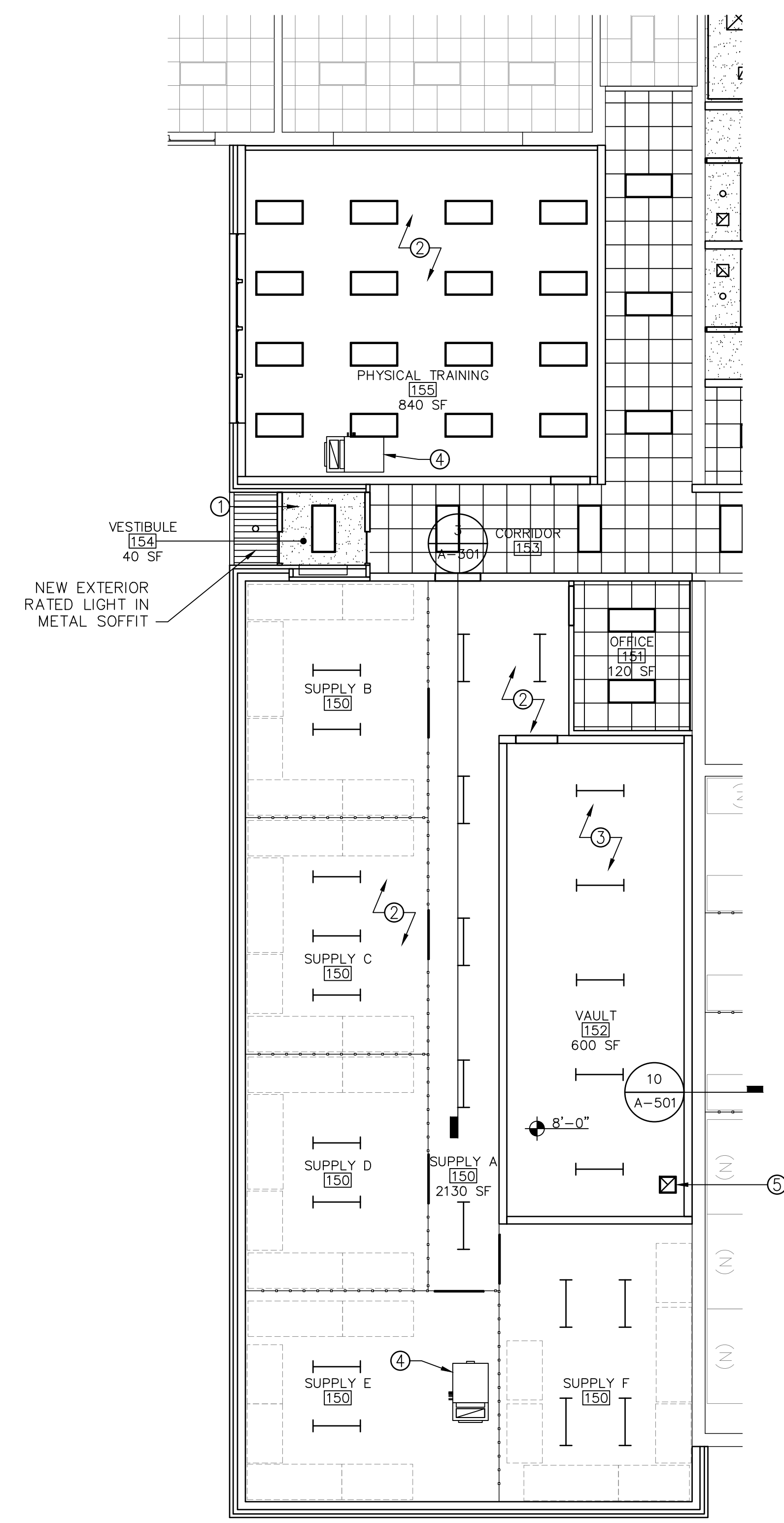


KEY NOTES:

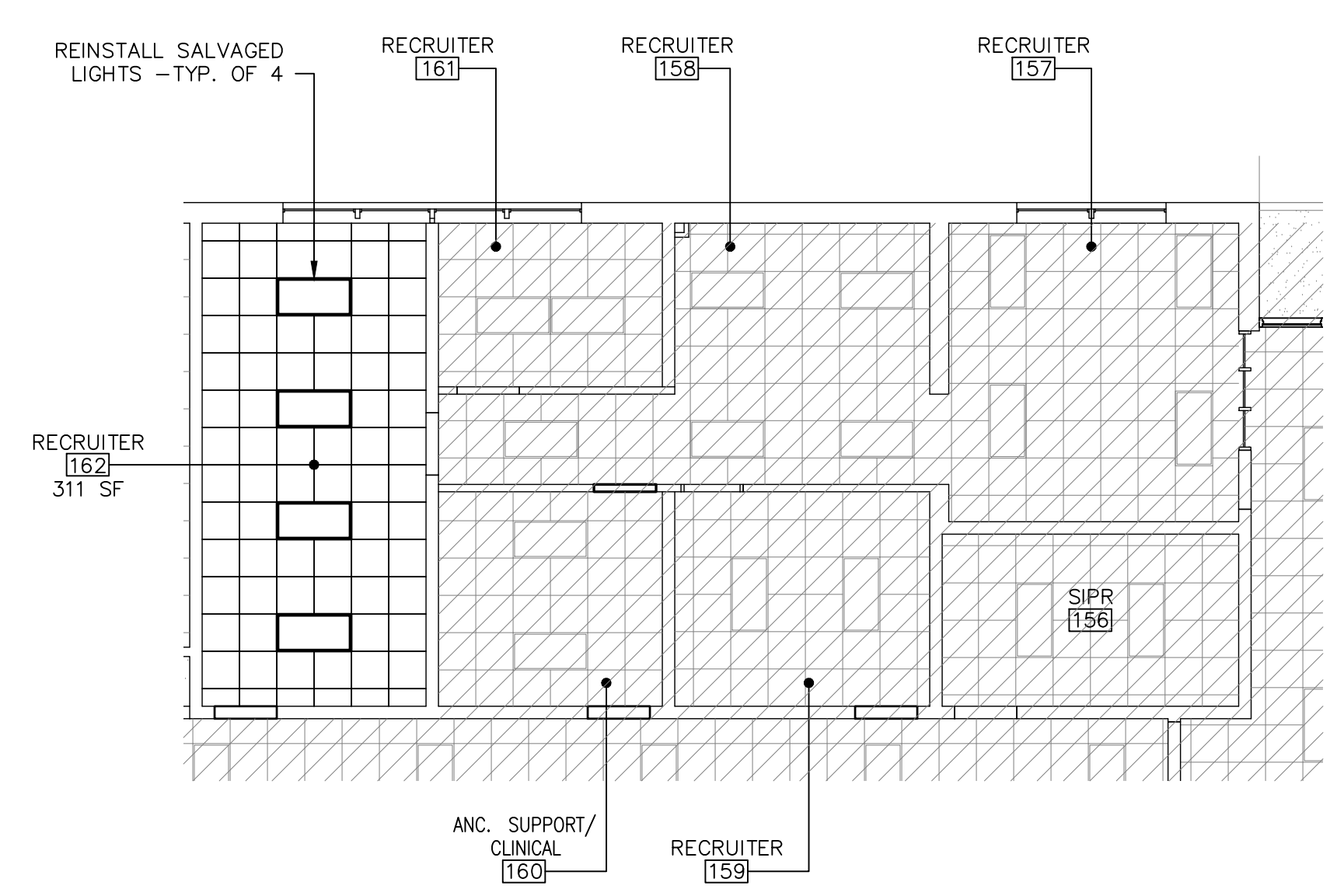
- ① NEW PAINTED GYPSUM BOARD CEILING
- ② CEILING OPEN TO STRUCTURE – PAINT STRUCTURE
- ③ PAINT CONCRETE CEILING
- ④ NEW MECHANICAL UNIT SUSPENDE FROM ROOF STRUCTURE
- ⑤ NEW RELIEF AIR VENT. REFER TO STRUCTURAL FOR OPENING IN CONCRETE VAULT CEILING.

LEGEND:

- EXISTING LIGHT FIXTURES
- EXISTING GYPSUM BOARD CEILING
- NEW 24"X 48" LIGHT FIXTURE
- NEW GYPSUM BOARD CEILING
- NEW WALL
- EXISTING WALL
- NEW HVAC SUPPLY
- NEW HVAC EXHAUST GRILLE
- NEW ACCESS PANEL
- NEW DOWN LIGHT
- NEW 12"X 48" LIGHT FIXTURE
- NEW SURFACE MOUNTED DROP FIXTURE
- NEW 2'X2' ACOUSTICAL CEILING AND GRID
- EXISTING 2'X2' ACOUSTICAL CEILING AND GRID
- NEW MECHANICAL UNIT. REFER TO MECHANICAL.
- NEW METAL SOFFIT AND FRAMING



1
 A-404
 ENLARGED SUPPLY, VAULT, AND PHYSICAL TRAINING ROOM REFLECTED CEILING PLAN
 SCALE: 1/8"=1'-0"



2
 A-404
 ENLARGED RECRUITING OFFICES REFLECTED CEILING PLAN
 SCALE: 1/8"=1'-0"

GENERAL NOTES:

- COORDINATE ROOM NUMBERS FOR SIGNAGE DURING CONSTRUCTION.
- REFER TO RCP FOR PAINTING NEW GYPSUM BOARD CEILINGS AND PAINTING NEW AND EXISTING STRUCTURE.
- FURNITURE TO BE PROVIDED BY DMVA U.N.O.

KEYNOTES:

- PAINT CEILING / STRUCTURE REFER TO A-403 AND A/404.
- NEW CORNER GUARD
- NEW MARBLE THRESHOLD

FINISH KEY NOTES:

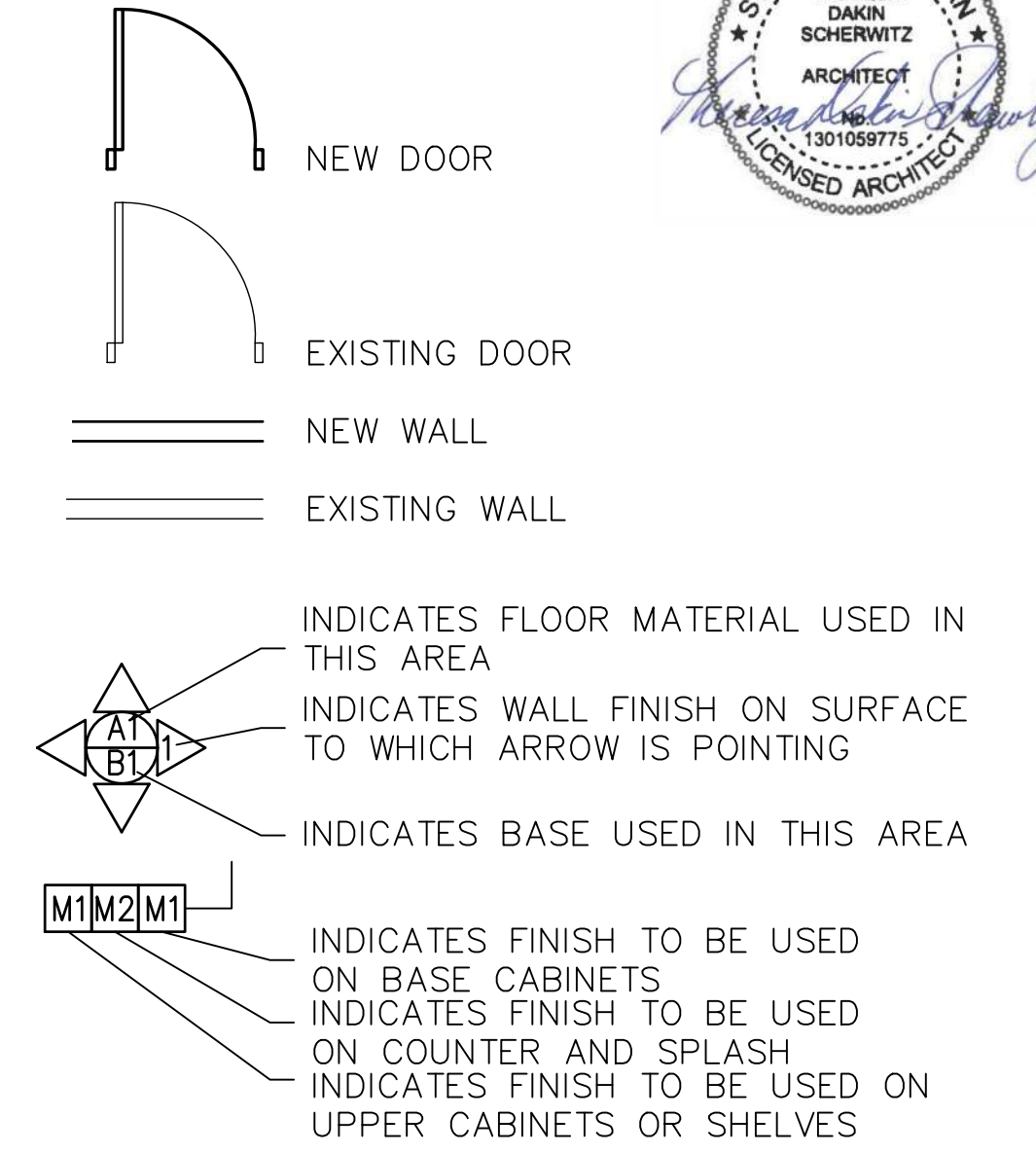
FLOORING:

- F1 LVT
MANUFACTURER: SHAW
CONTRACT
COLLECTION: VERTICAL LAYERS
COLOR: GRIT 01530
SIZE: 9"x36"
 - F2 CARPET TILE
MANUFACTURER: TARKETT
COLLECTION: FIELD DAY 03377
COLOR: TANDUS
SIZE: 24"x24"
 - F3 PORCELAIN TILE
MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: CENERE
SIZE: 12"x24"
 - F4 FINISHED CONCRETE (SEAL - REFER TO SPEC 03 30 00)
 - F5 RUBBERIZED ATHLETIC FLOORING
MANUFACTURER: NORA
COLLECTION: NORAMENT 992
COLOR: GIBSON METEORITE 4897
 - F6 CAST STONE EPOXY FLOOR COVERING
MANUFACTURER: STONHARD
STYLE: STONTEC
COLOR: SHENANDOAH BUFF
- MILLWORK:**
M1 BASE CABINETS
MANUFACTURER: WILSON ART
COLOR: 5TH AVE. ELM 7966
- TOILET ROOM PARTITION:**
MANUFACTURER: ACCURATE CORPORATION
COLOR: GRAY WHITE SPECKLE 992

WALL FINISH:

- 1 WALL PAINT
MANUFACTURER: SHERWIN WILLIAMS
COLOR: POPULAR GRAY
NUMBER: SW 6071
 - 2 PORCELAIN WALL TILE
MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: SILVER
SIZE: 6"x24"
 - 3 WALL PAINT
MANUFACTURER: SHERWIN WILLIAMS
COLOR: MARSHMALLOW
NUMBER: SW 7001
 - 4 PORCELAIN BULLNOSE
MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: SILVER
SIZE: 3"x12"
- BASE:**
B1 RESILIENT BASE
MANUFACTURER: MANNINGTON
COLOR: 503 GINGER
- B2 PORCELAIN WALL BASE
MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: CENERE
SIZE: 6"x12"
NOTE: CUT FLOOR TILE AND INSTALL SCHLUTER STRIP TO MATCH EXISTING

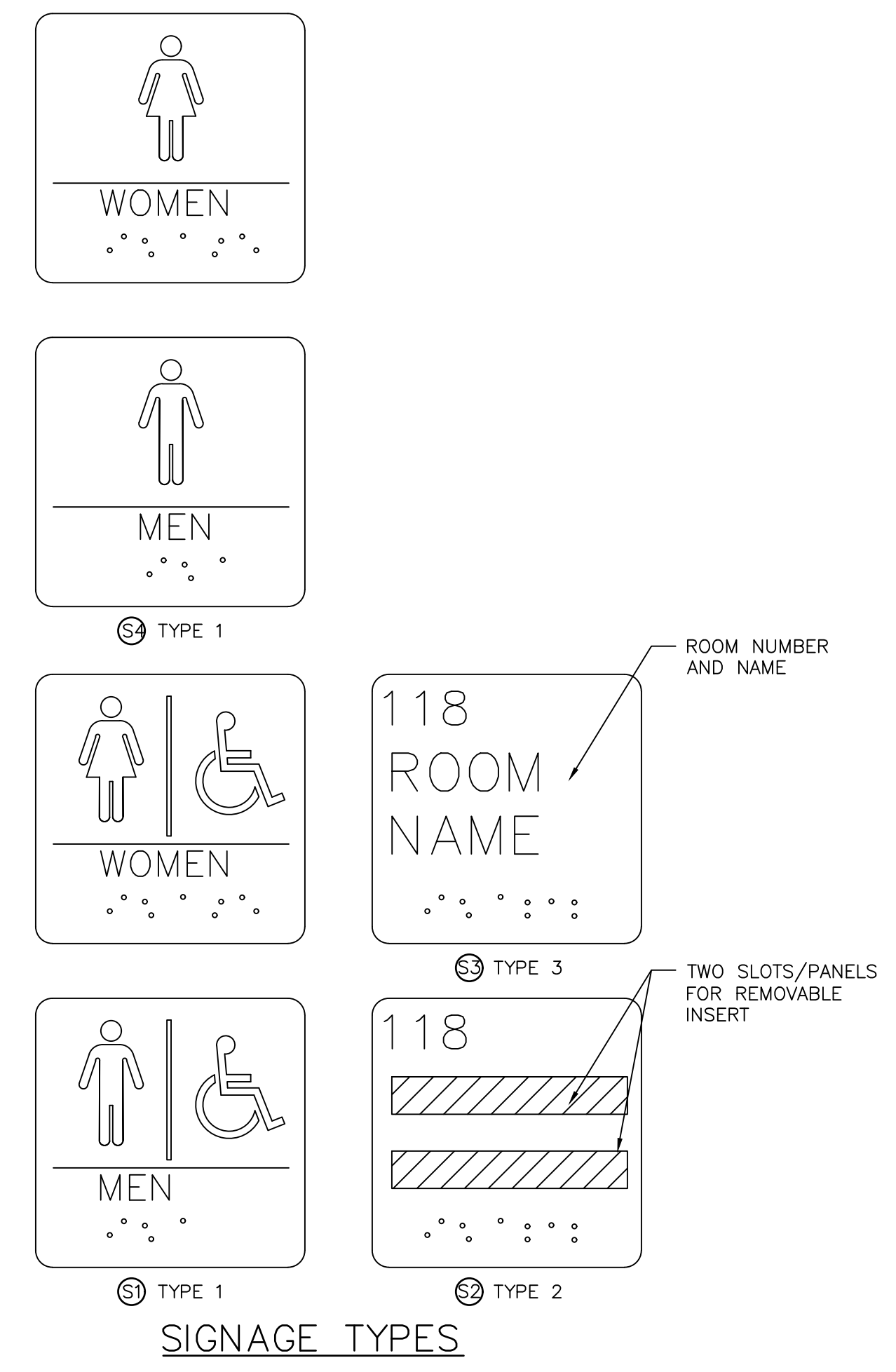
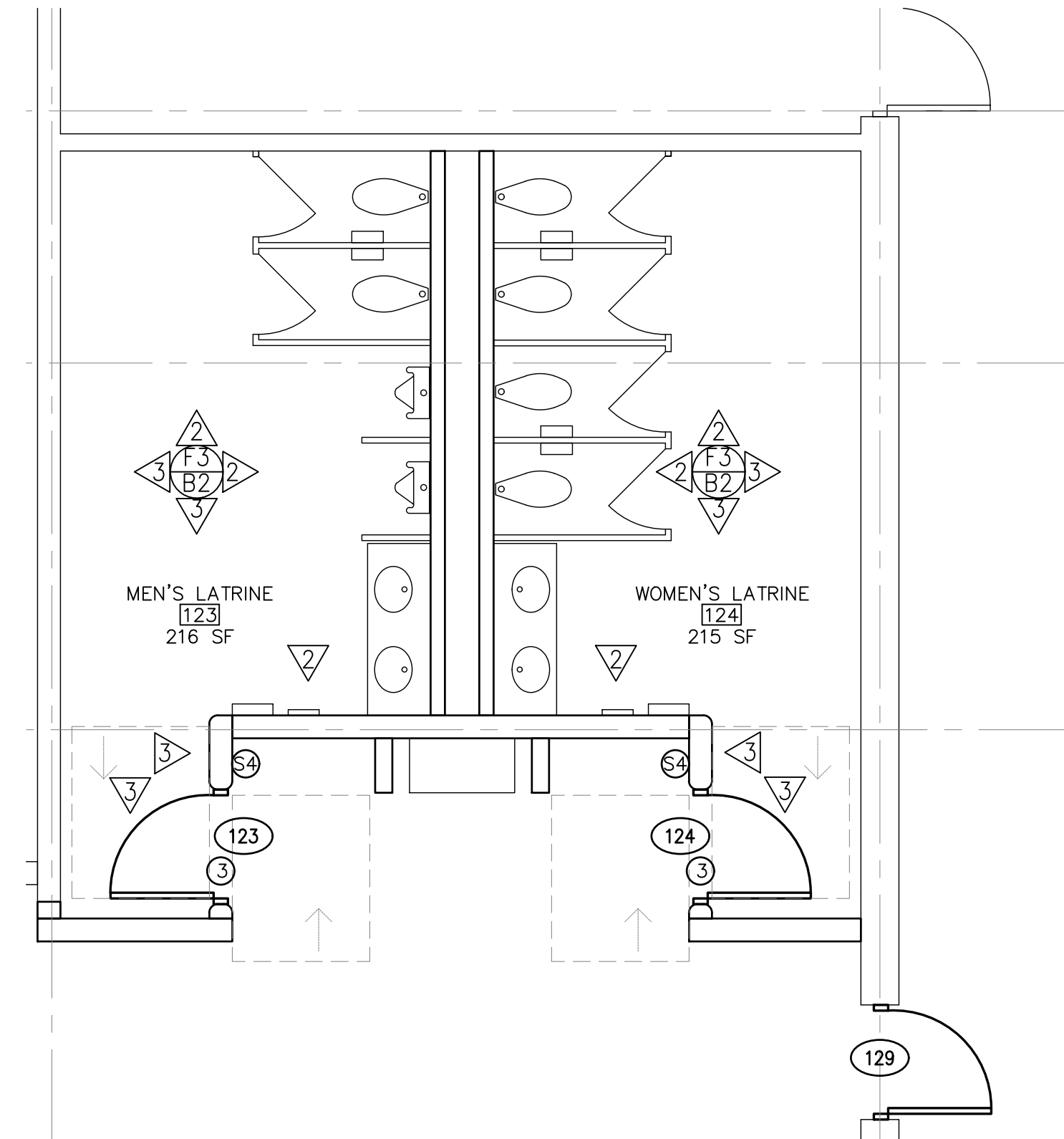
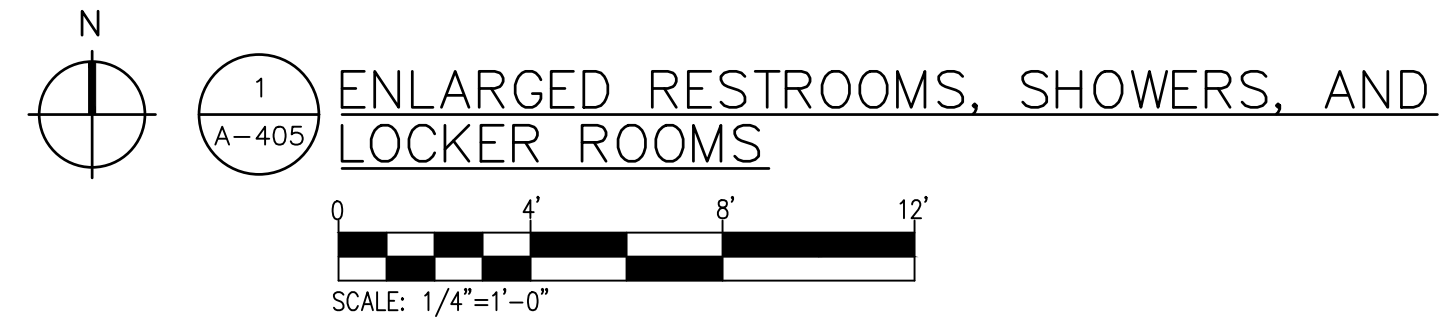
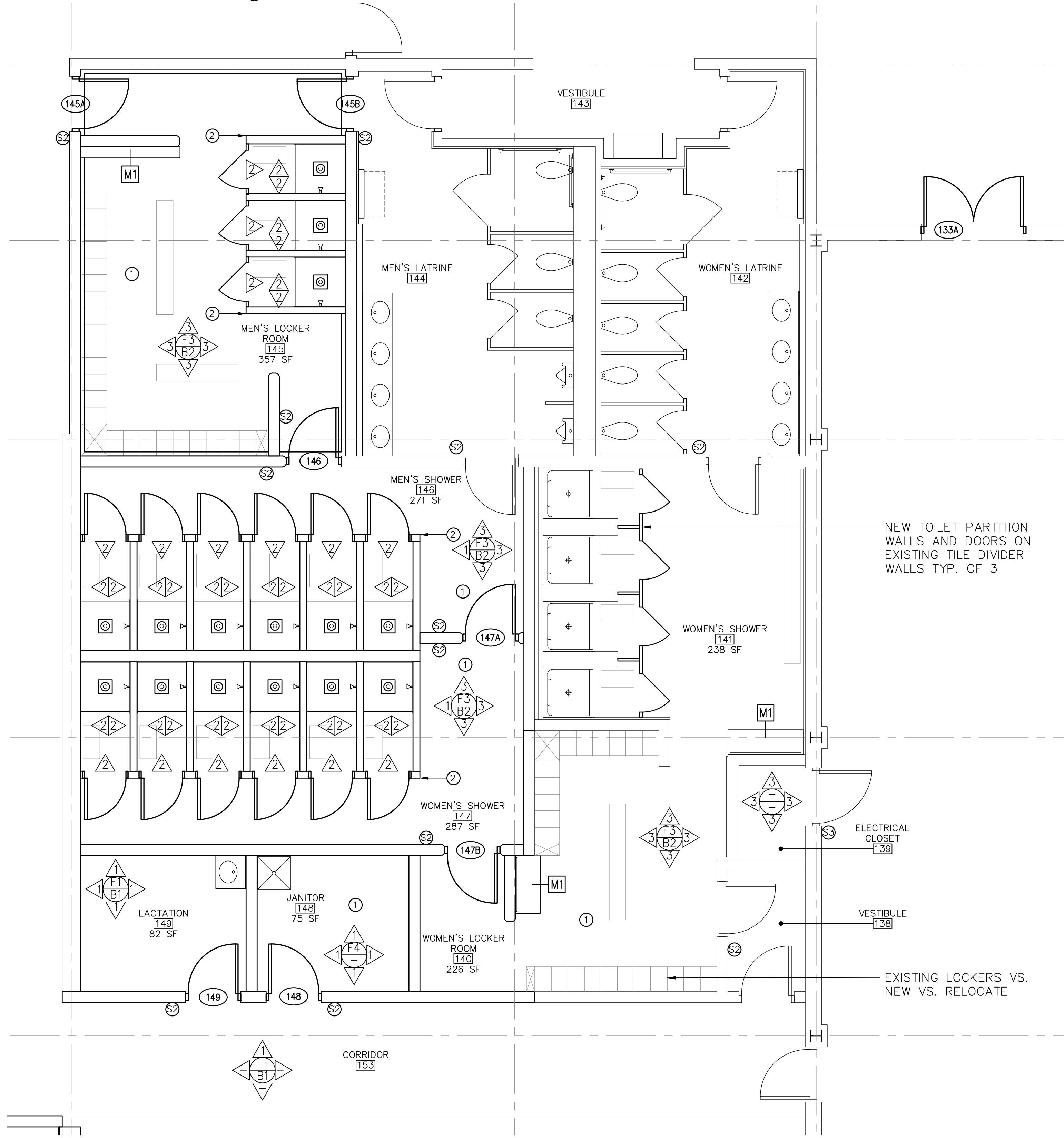
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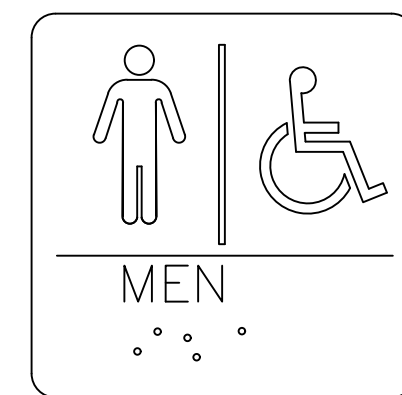
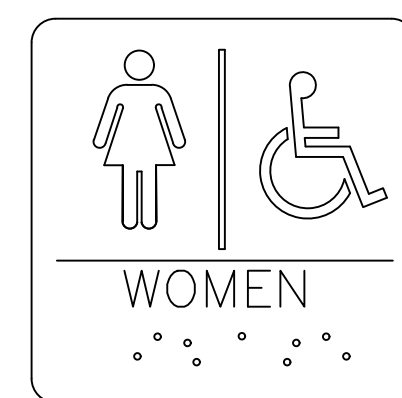
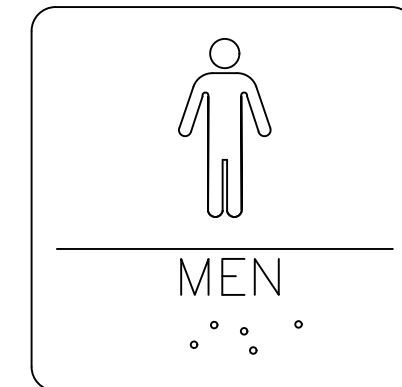
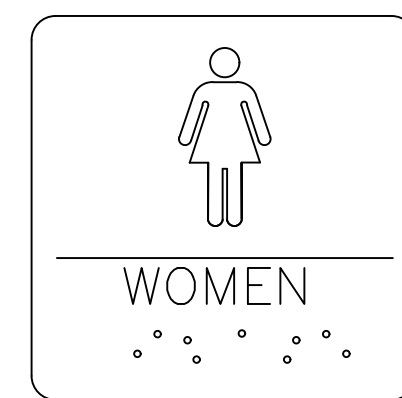


STATE OF MICHIGAN
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PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

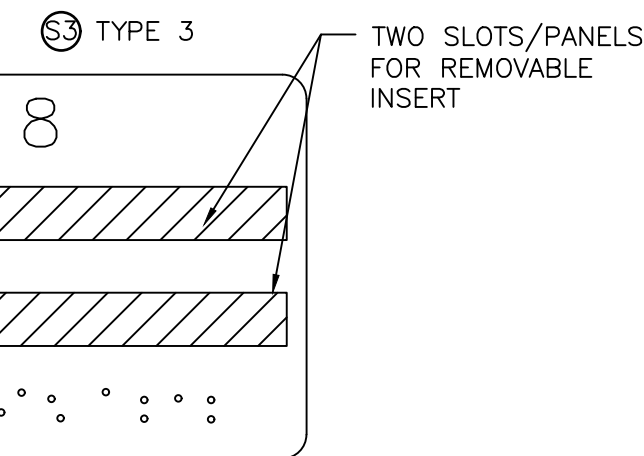
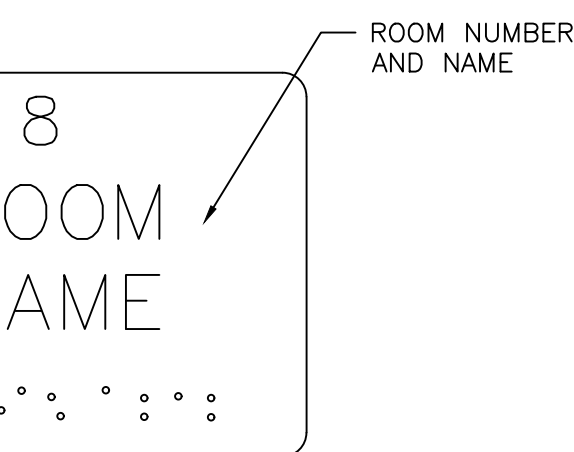
816 E. 4th ST.
Royal Oak, MI 48067
248.542.7866 / www.gforbes.com
FORBES
ARCHITECTS, PLLC

PROJECT: RENOVATE ARMORY WASHTEAW
DESIGNED BY: DT
DATE: 04/01/2022
ISSUED FOR: CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER: PROJECT: WASHTEAW ARMORY, CONTRACT NUMBER: Y21456, FILE NO. 511/2126/CAK, DMVA PROJECT NO. 2668022016
SHEET NUMBER: 47 OF 96
DRAWING TITLE: ENLARGED FURNITURE AND FINISH PLAN
DRAWING NUMBER: A-405





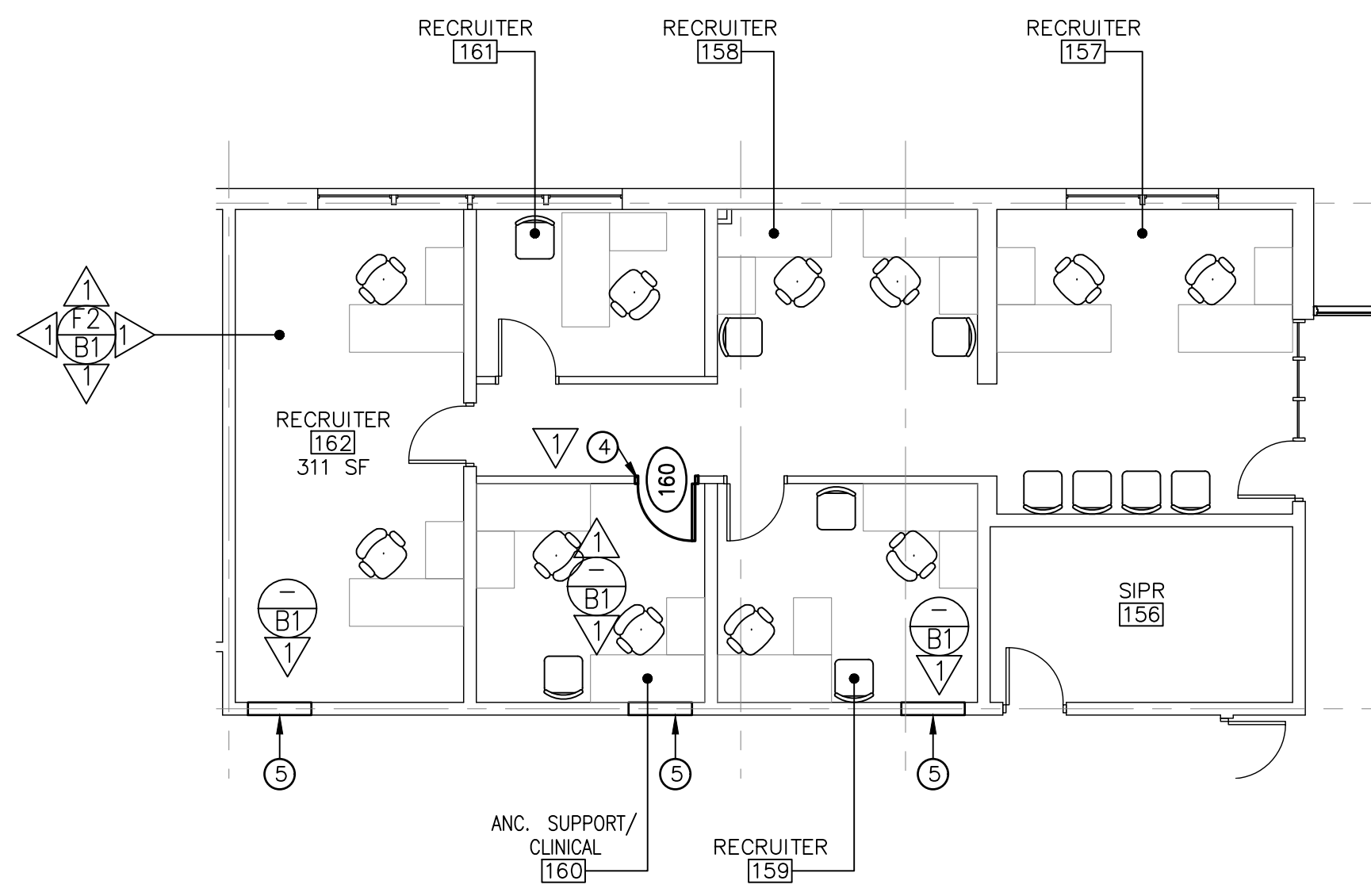
TYPE 1



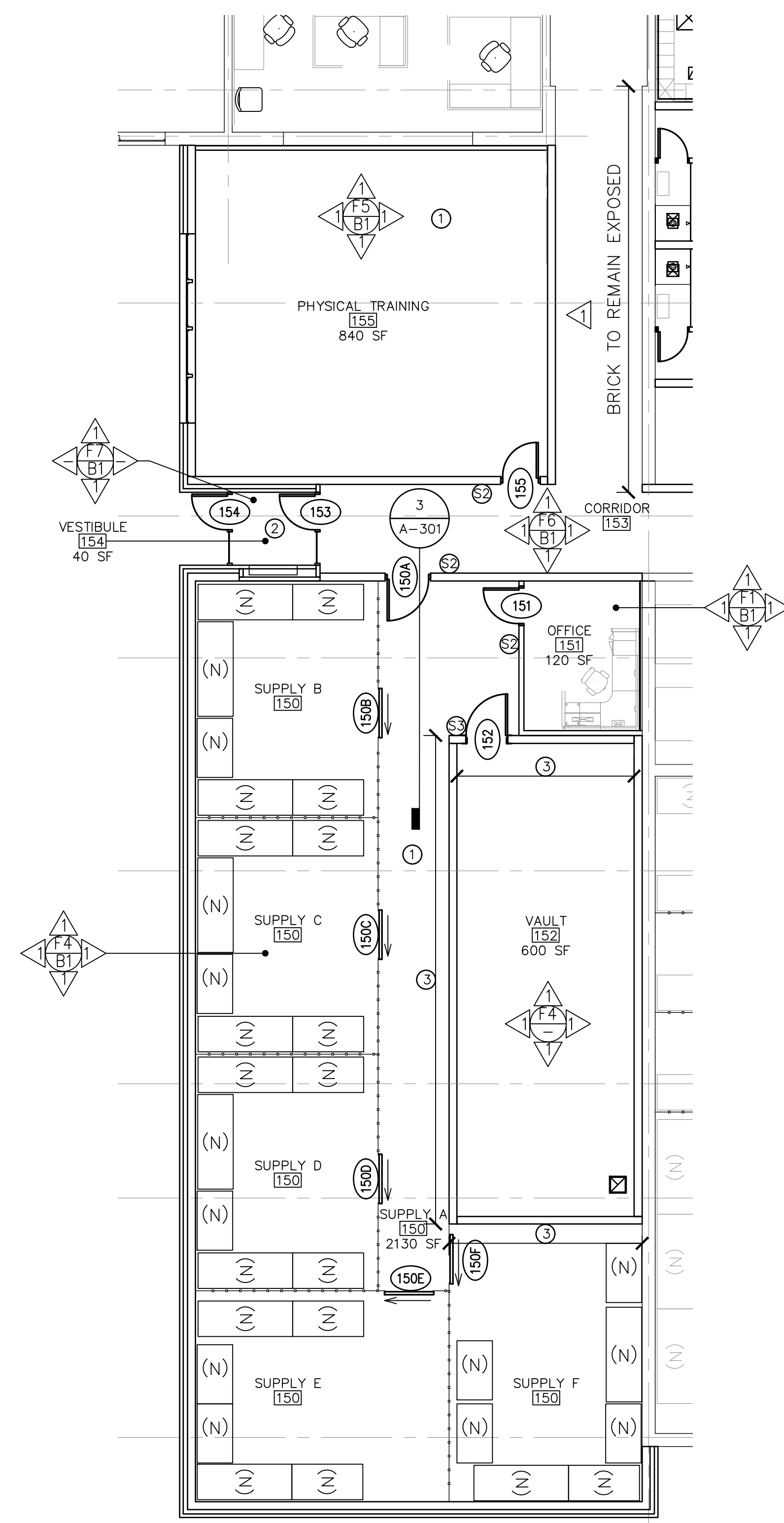
TYPE 1

TYPE 2

SIGNAGE TYPES



1 ENLARGED RECRUITING OFFICES
A-406 SCALE: 1/4"=1'-0"



2 ENLARGED SUPPLY, VAULT, AND PHYSICAL TRAINING ROOM
A-406 SCALE: 1/4"=1'-0"

GENERAL NOTES:

- COORDINATE ROOM NUMBERS FOR SIGNAGE DURING CONSTRUCTION.
- REFER TO RCP FOR PAINTING NEW GYPSUM BOARD CEILINGS AND PAINTING NEW AND EXISTING STRUCTURE.
- FURNITURE TO BE PROVIDED BY DMVA U.N.O.

KEYNOTES:

- PAINT CEILING / STRUCTURE REFER TO A-403 AND A/404.
- INSTALL SURFACE MOUNTED 3/8" WALK-OFF MAT ON CONCRETE IN VESTIBULE. PROVIDE EDGING AS NECESSARY AND COORDINATE WITH THRESHOLDS.
- PARGE AND PAINT VAULT WALL COMPLETE - BOTH SIDES
- REPLACE CARPET TILES AT NEW DOOR OPENING TO PROVIDE SEAMLESS TRANSITION
- PAINT WALL WHERE DOOR IS INFILLED - REFER TO ELEVATION 6 ON A502.

FINISH KEY NOTES:

- FLOORING:**
- F1 LVT
MANUFACTURER: SHAW
CONTRACT
COLLECTION: VERTICAL LAYERS
COLOR: GRIT 01530
SIZE: 9"X36"
 - F2 CARPET TILE
MANUFACTURER: TARKETT
COLLECTION: FIELD DAY 03377
COLOR: TANDUS
SIZE: 24"X24"
 - F3 PORCELAIN TILE
MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: CENERE
SIZE: 12"X24"
 - F4 FINISHED CONCRETE (SEAL - REFER TO SPEC 03 30 00)
 - F5 RUBBERIZED ATHLETIC FLOORING
MANUFACTURER: NORA
COLLECTION: NORAMENT 992
COLOR: GIBSON METEORITE 4897
 - F6 CAST STONE EPOXY FLOOR COVERING
MANUFACTURER: STONHARD
STYLE: STONTEC
COLOR: SHENANDOAH BUFF
- WALL FINISH:**
- 1 WALL PAINT
MANUFACTURER: SHERWIN WILLIAMS
COLOR: POPULAR GRAY
NUMBER: SW 6071
 - 2 PORCELAIN WALL TILE
MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: SILVER
SIZE: 6"X24"
 - 3 WALL PAINT
MANUFACTURER: SHERWIN WILLIAMS
COLOR: MARSHMALLOW
NUMBER: SW 7001
 - 4 PORCELAIN BULLNOSE MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: SILVER
SIZE: 3"X12"
- BASE:**
- B1 RESILIENT BASE
MANUFACTURER: MANNINGTON
COLOR: 503 GINGER
 - B2 PORCELAIN WALL BASE
MANUFACTURER: MILESTONE - FLORIM USA
COLLECTION: STRATOS
COLOR: CENERE
SIZE: 6"X12"
NOTE: CUT FLOOR TILE AND INSTALL SCHLUTER STRIP TO MATCH EXISTING
- MILLWORK:**
- M1 BASE CABINETS
MANUFACTURER: WILSON ART
COLOR: 5TH AVE. ELM 7966
- TOILET ROOM PARTITION:**
- MANUFACTURER: ACCURATE CORPORATION
COLOR: GRAY WHITE SPECKLE 992

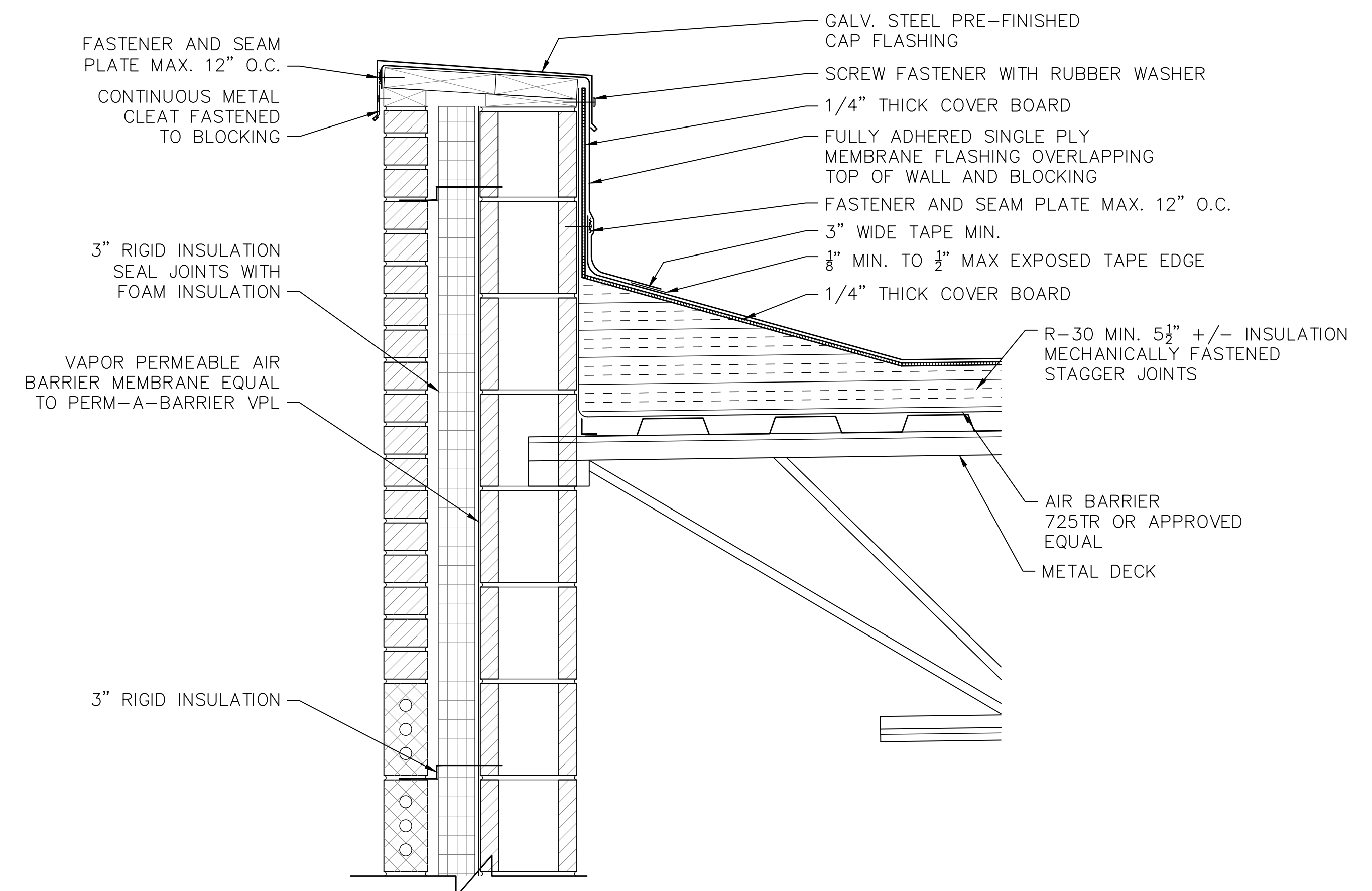
LEGEND:

- NEW DOOR
- EXISTING DOOR
- NEW WALL
- EXISTING WALL
- INDICATES FLOOR MATERIAL USED IN THIS AREA
- INDICATES WALL FINISH ON SURFACE TO WHICH ARROW IS POINTING
- INDICATES BASE USED IN THIS AREA
- M1|M2|M1 - INDICATES FINISH TO BE USED ON BASE CABINETS
- INDICATES FINISH TO BE USED ON COUNTER AND SPLASH
- INDICATES FINISH TO BE USED ON UPPER CABINETS OR SHELVES

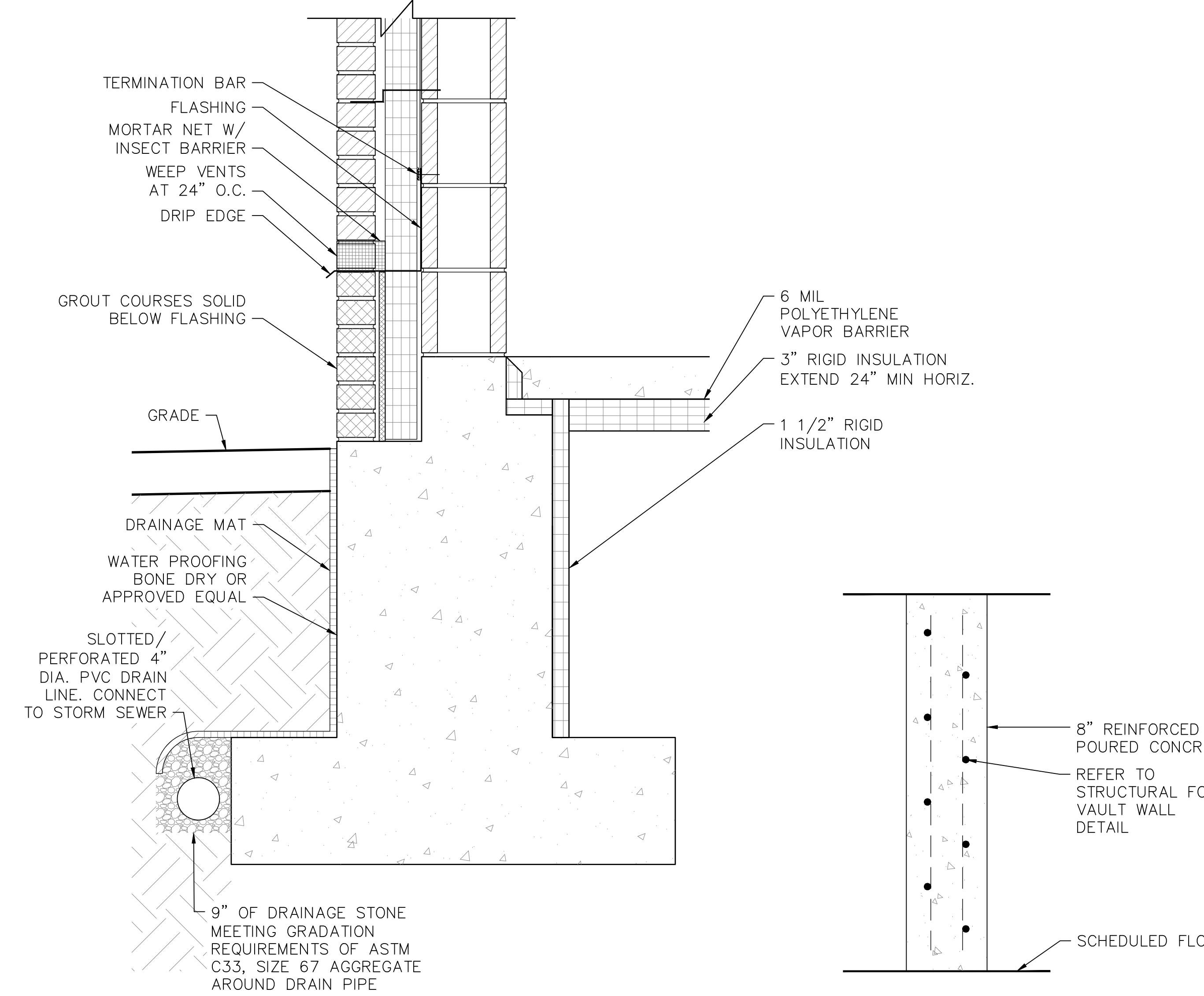




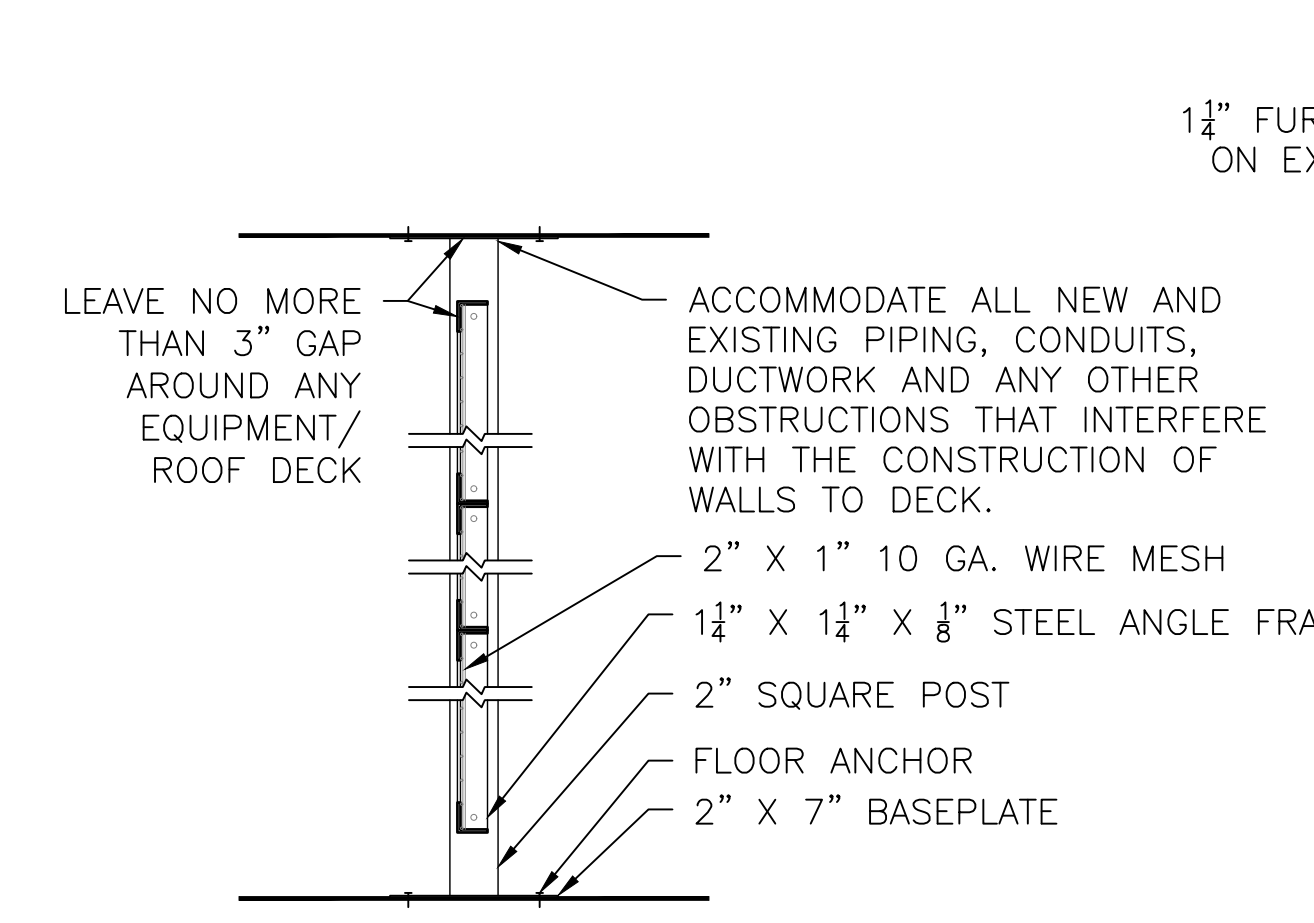
DRAWING NUMBER	SHEET NUMBER	ISSUED FOR	DATE	DESIGNED	PROJECT
A-501	49 OF 96	CONSTRUCTION DOCUMENTS	04/01/2022	DT CHECKED TDS APPROVED T. SCHERWITZ	RENOVATE ARMOYRY WASHTEAW ARMOYRY
IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMOYRY CONTRACT NUMBER: Y21456 FILE NO. 511/2126/CAK				



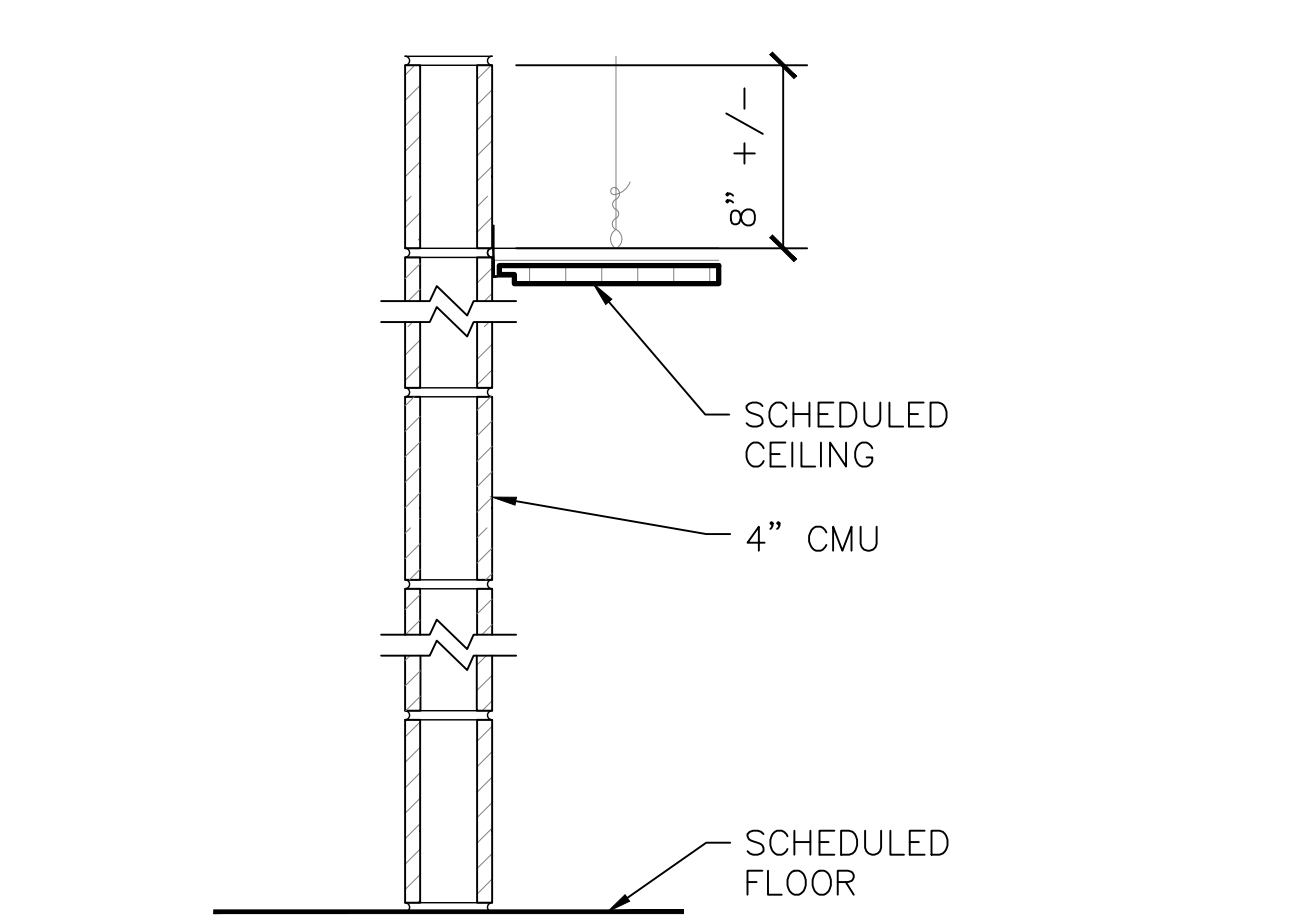
8 WALL TYPE H
 SCALE 1 1/2"=1'-0"



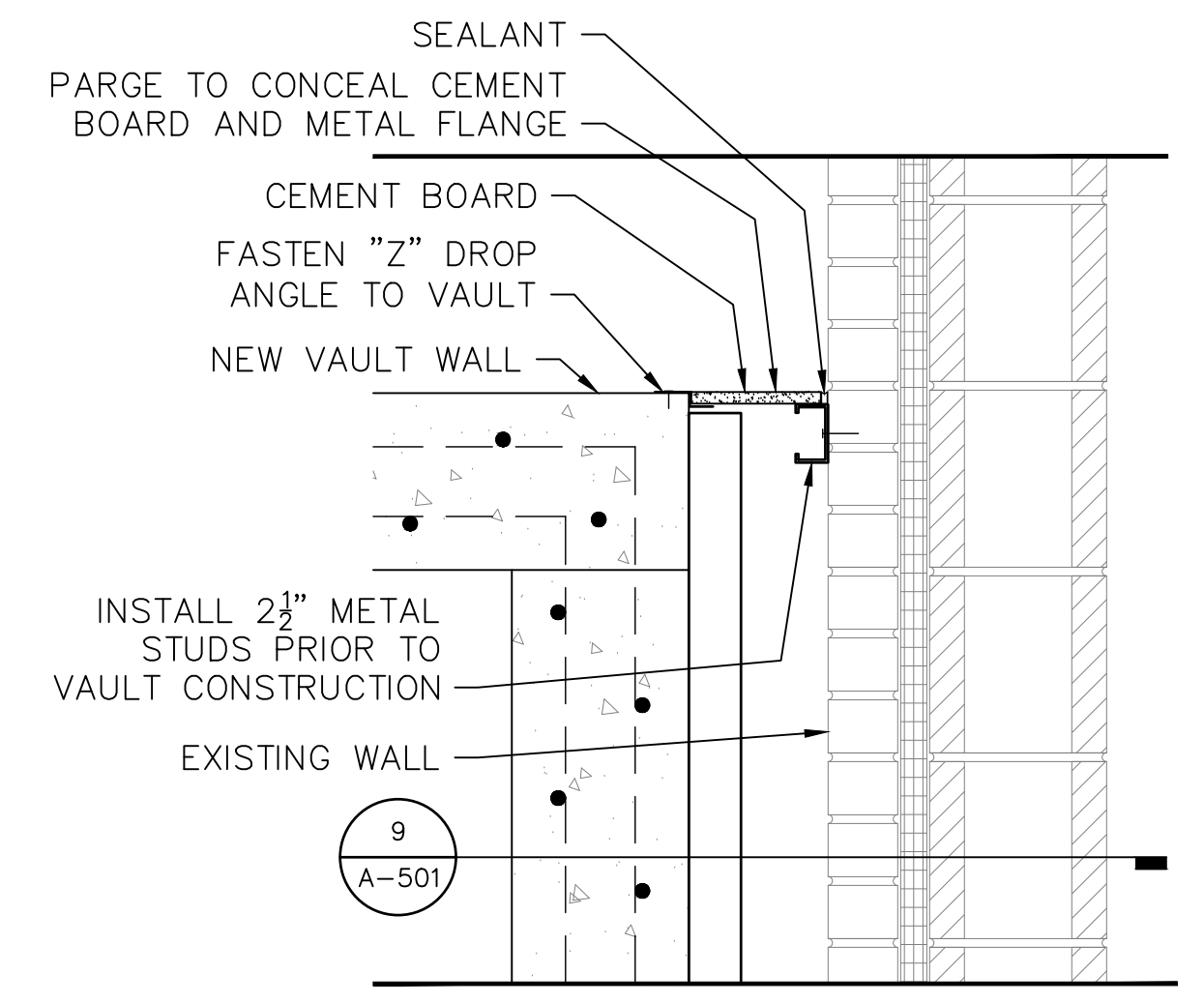
4 WALL TYPE D
 SCALE 1 1/2"=1'-0"



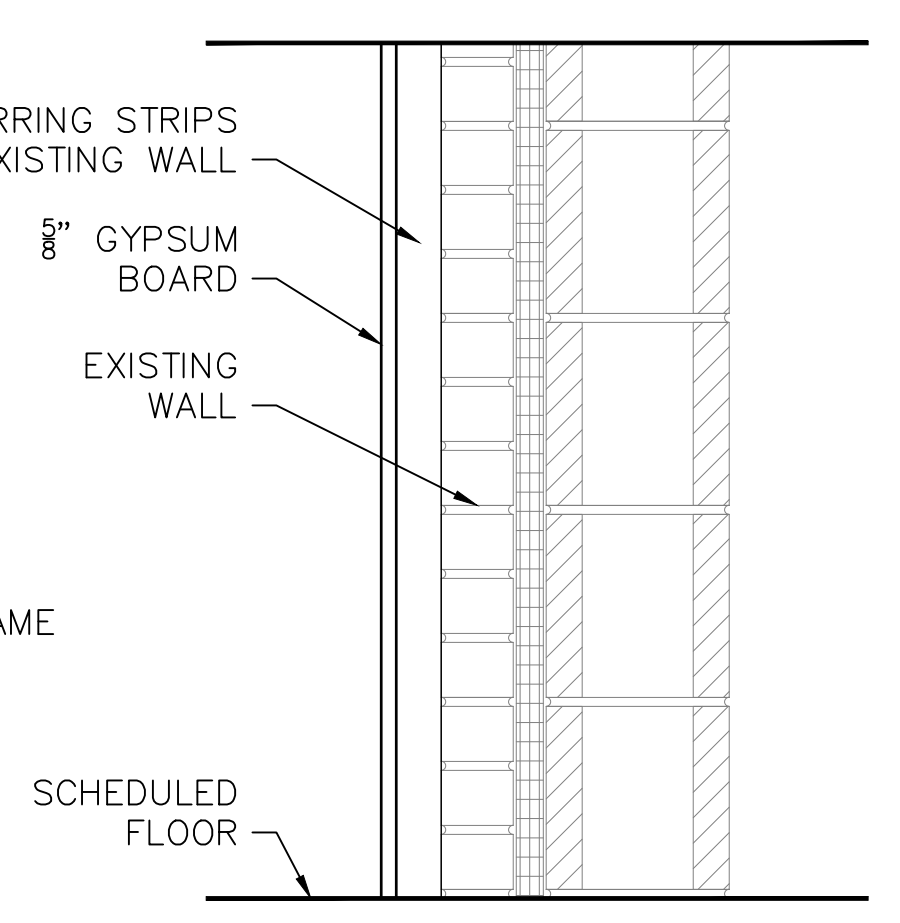
7 WALL TYPE G
 SCALE 1 1/2"=1'-0"



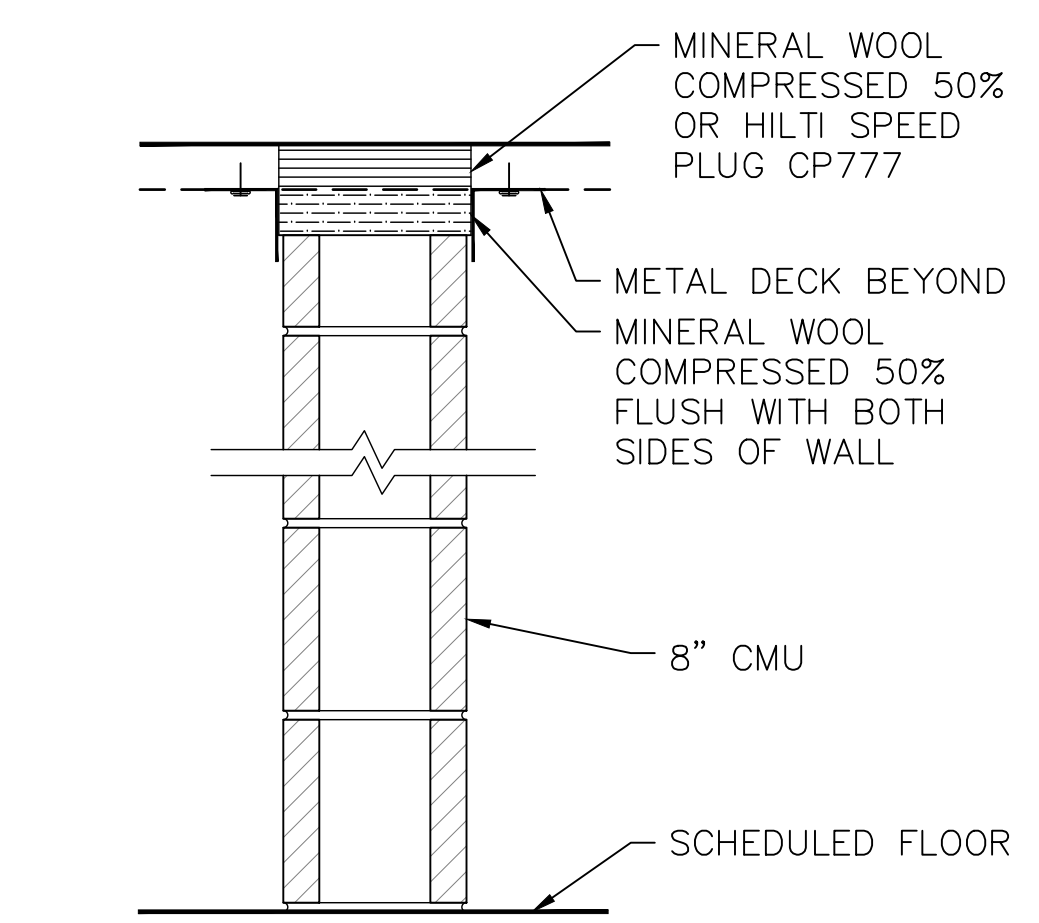
3 WALL TYPE C
 SCALE 1 1/2"=1'-0"



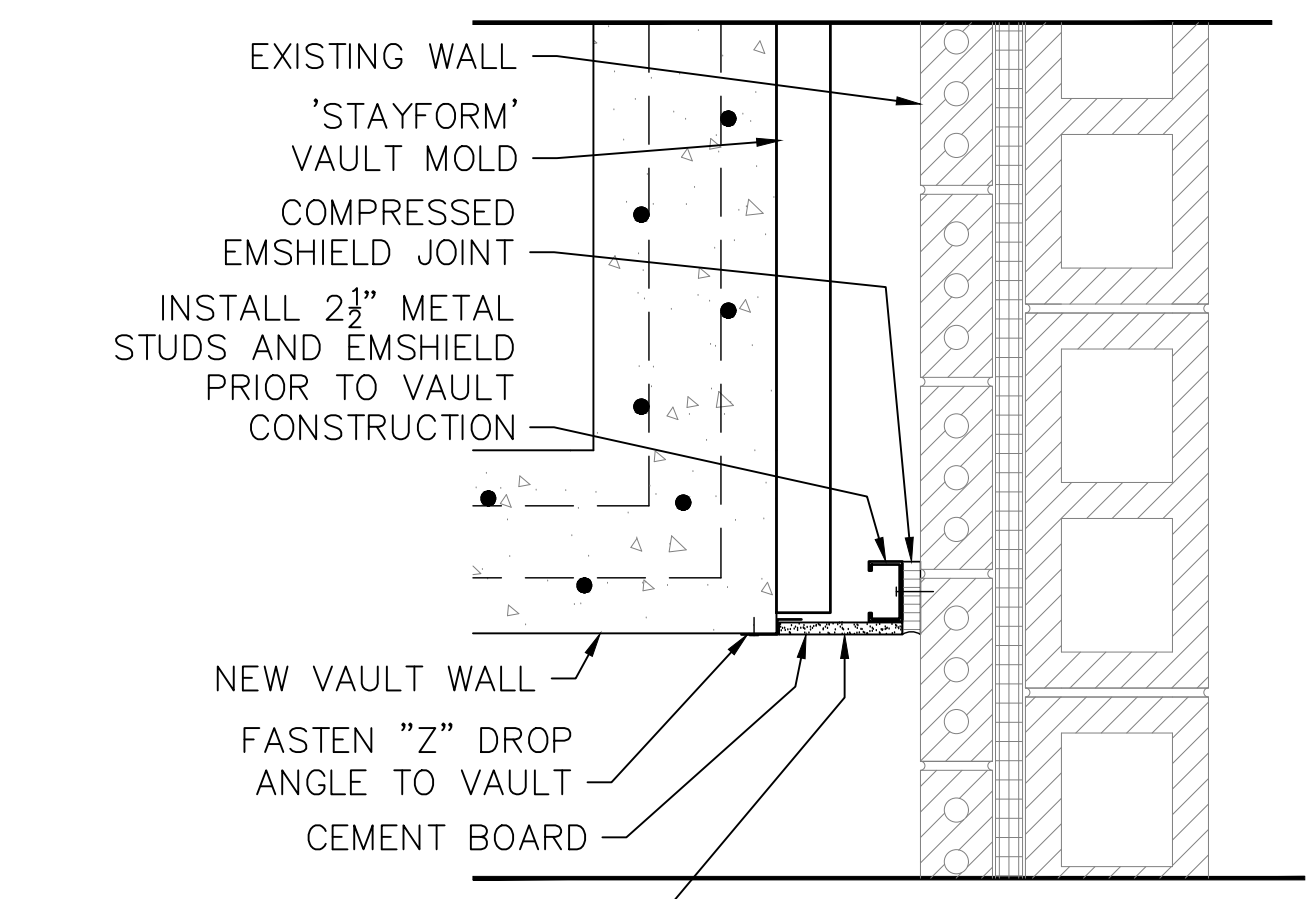
10 VAULT SECTION DETAIL AT EXISTING WALL
 SCALE 1 1/2"=1'-0"



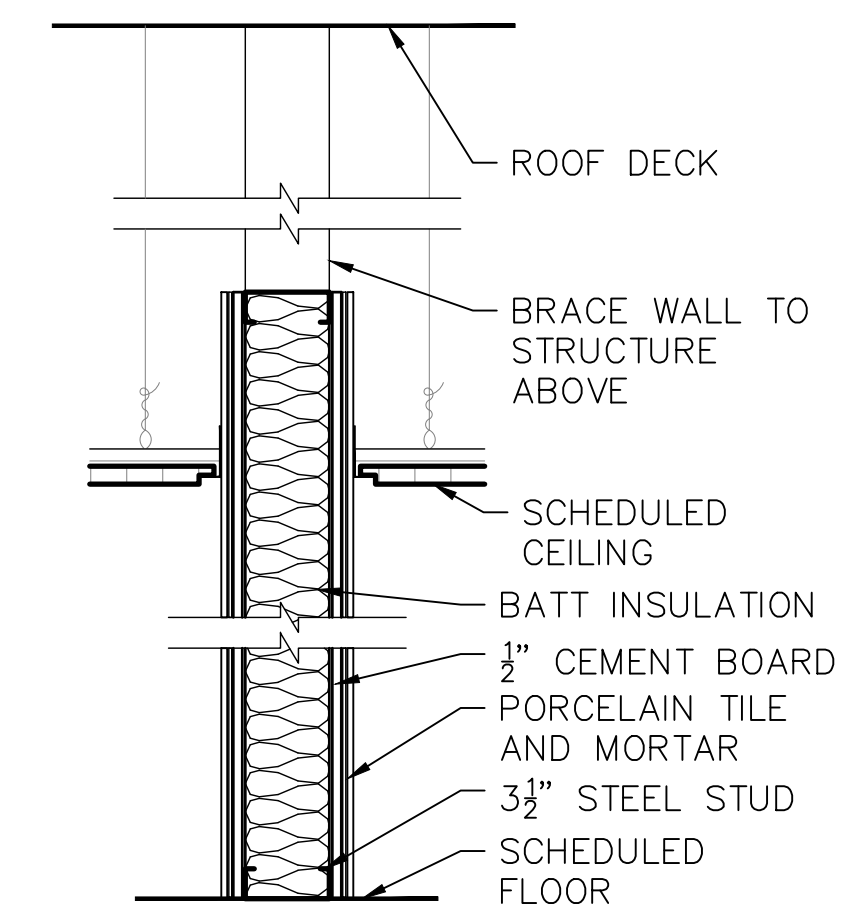
6 WALL TYPE F
 SCALE 1 1/2"=1'-0"



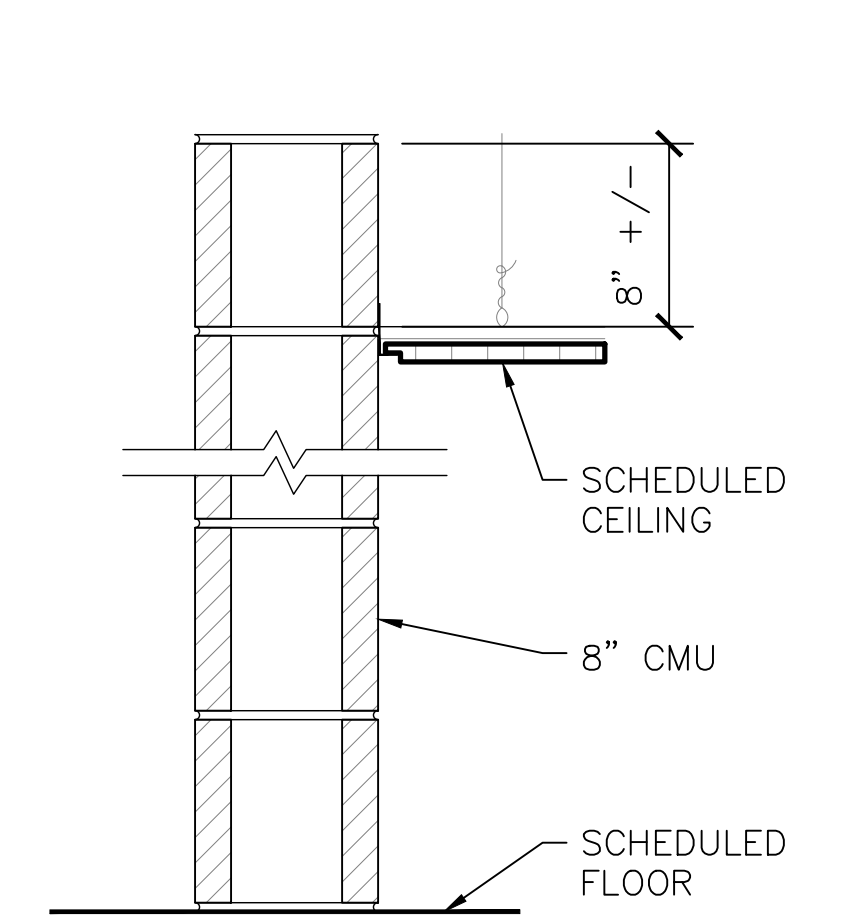
2 WALL TYPE B
 SCALE 1 1/2"=1'-0"



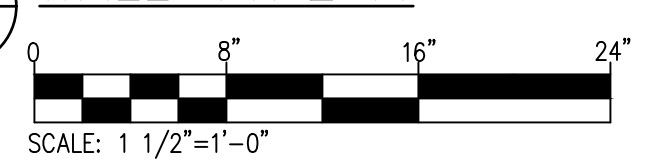
9 VAULT PLAN DETAIL AT EXISTING WALL
 SCALE 1 1/2"=1'-0"

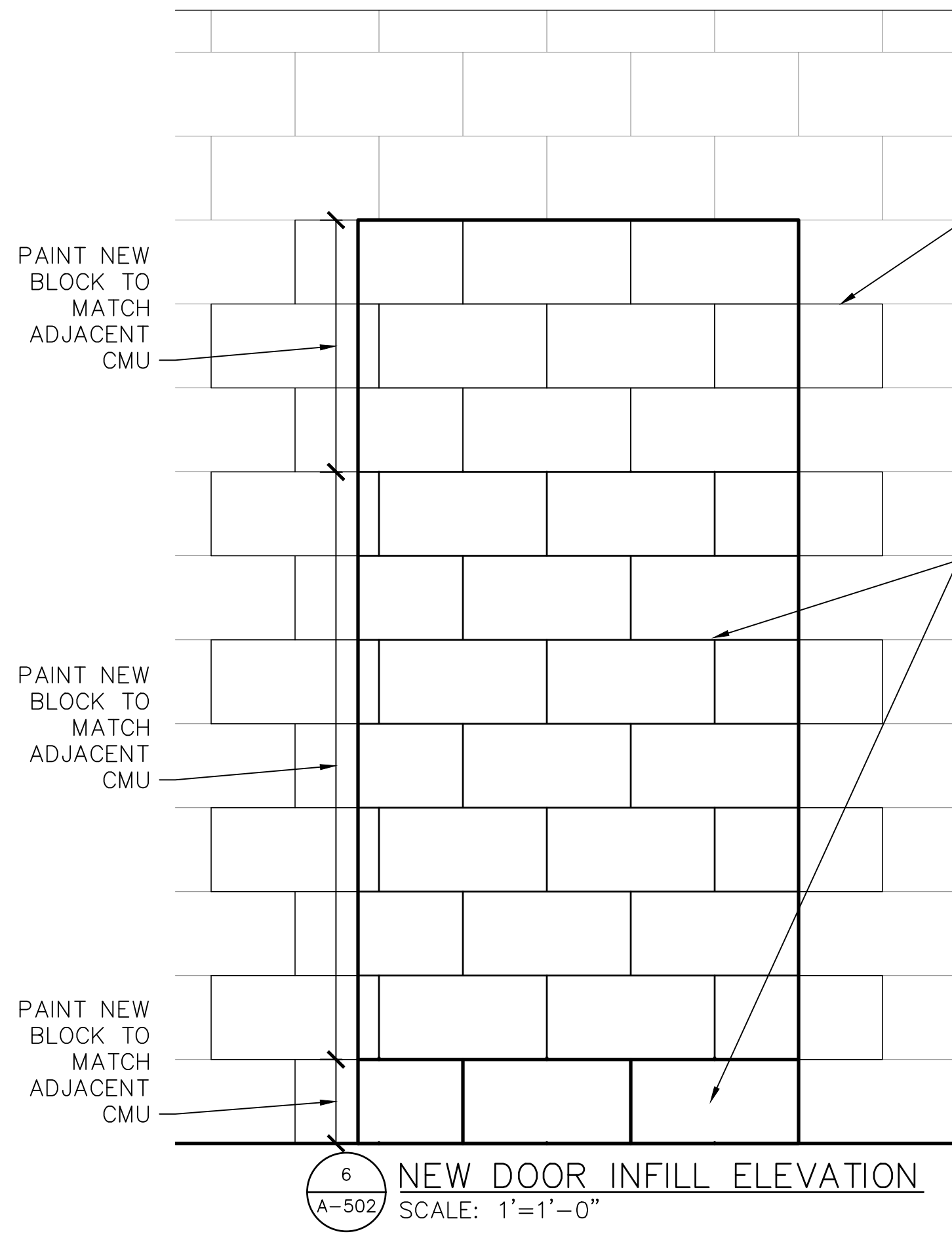


5 WALL TYPE E
 SCALE 1 1/2"=1'-0"

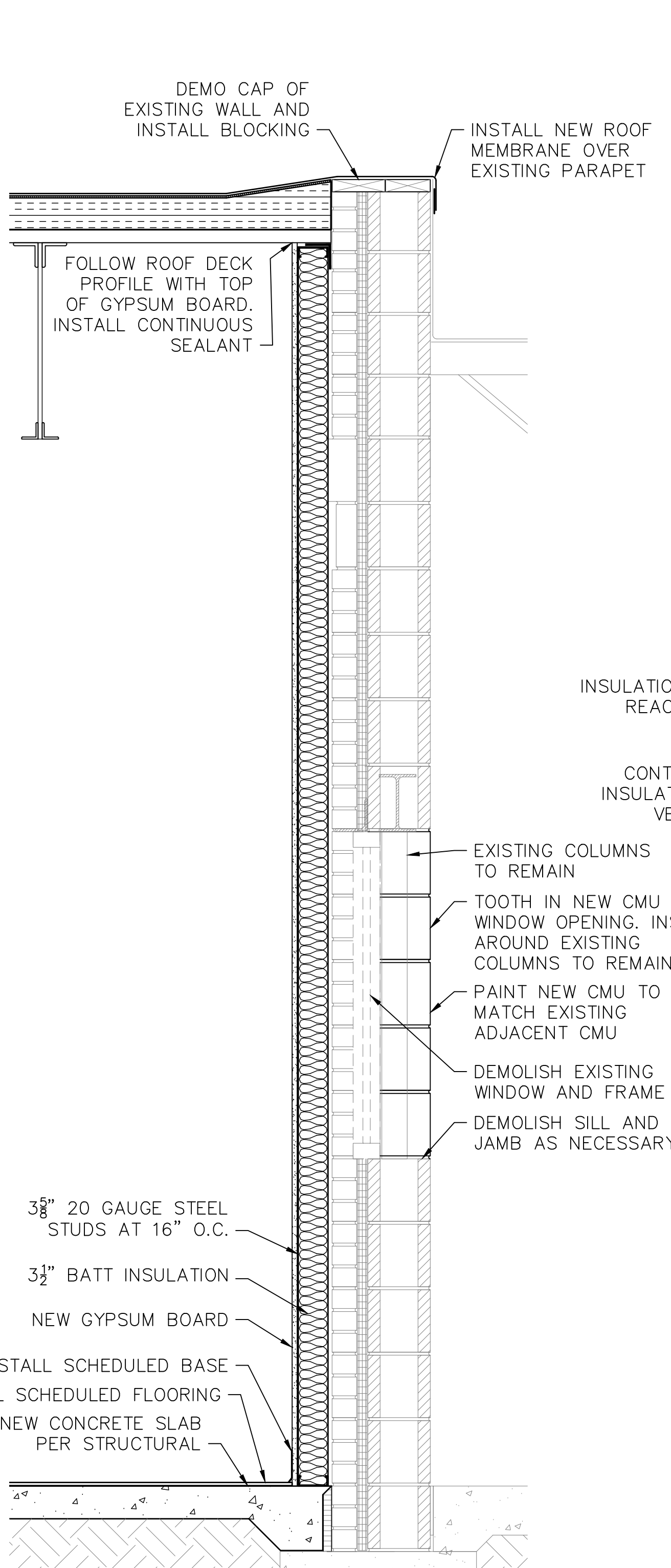


1 WALL TYPE A
 SCALE 1 1/2"=1'-0"

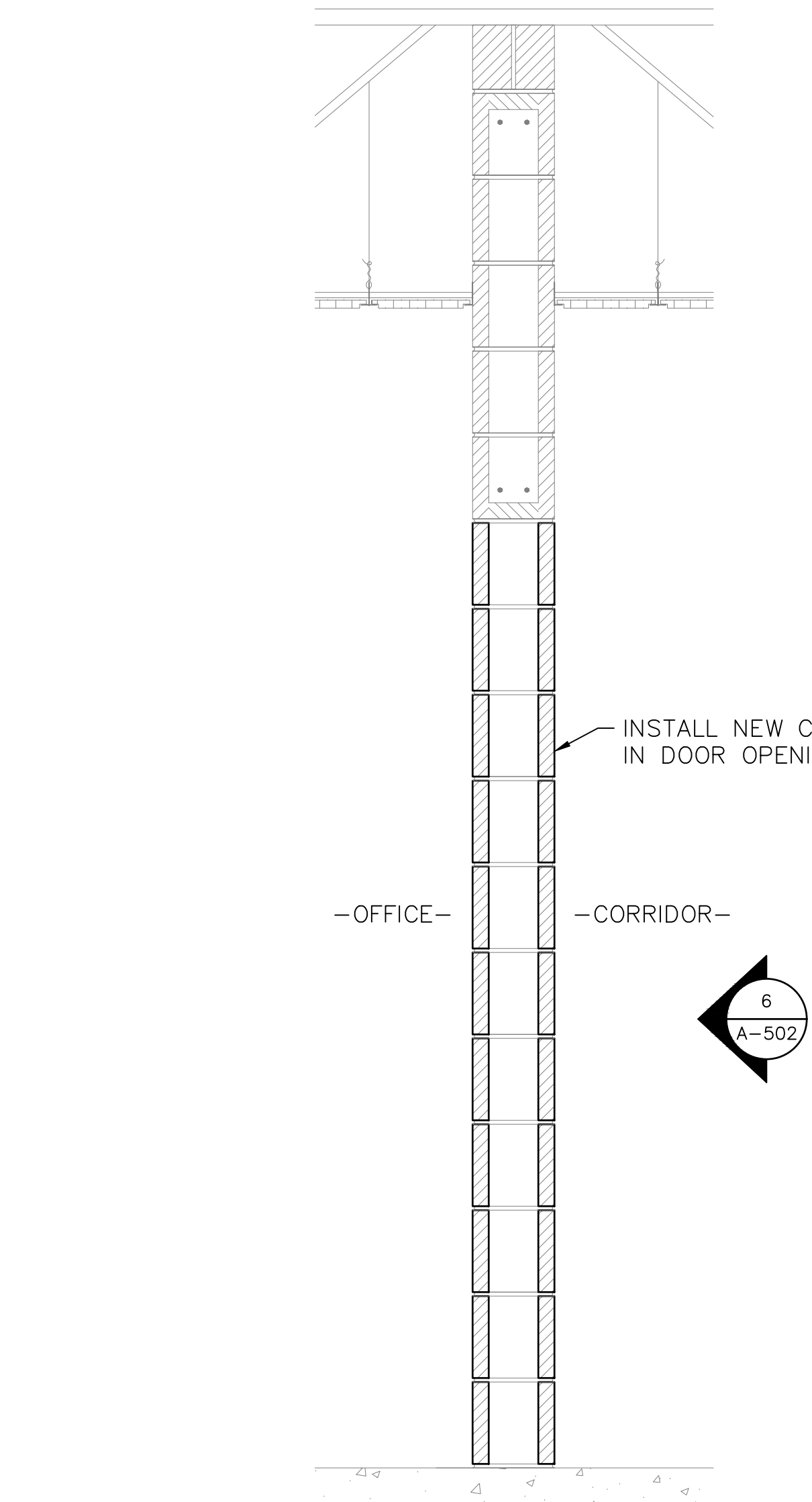




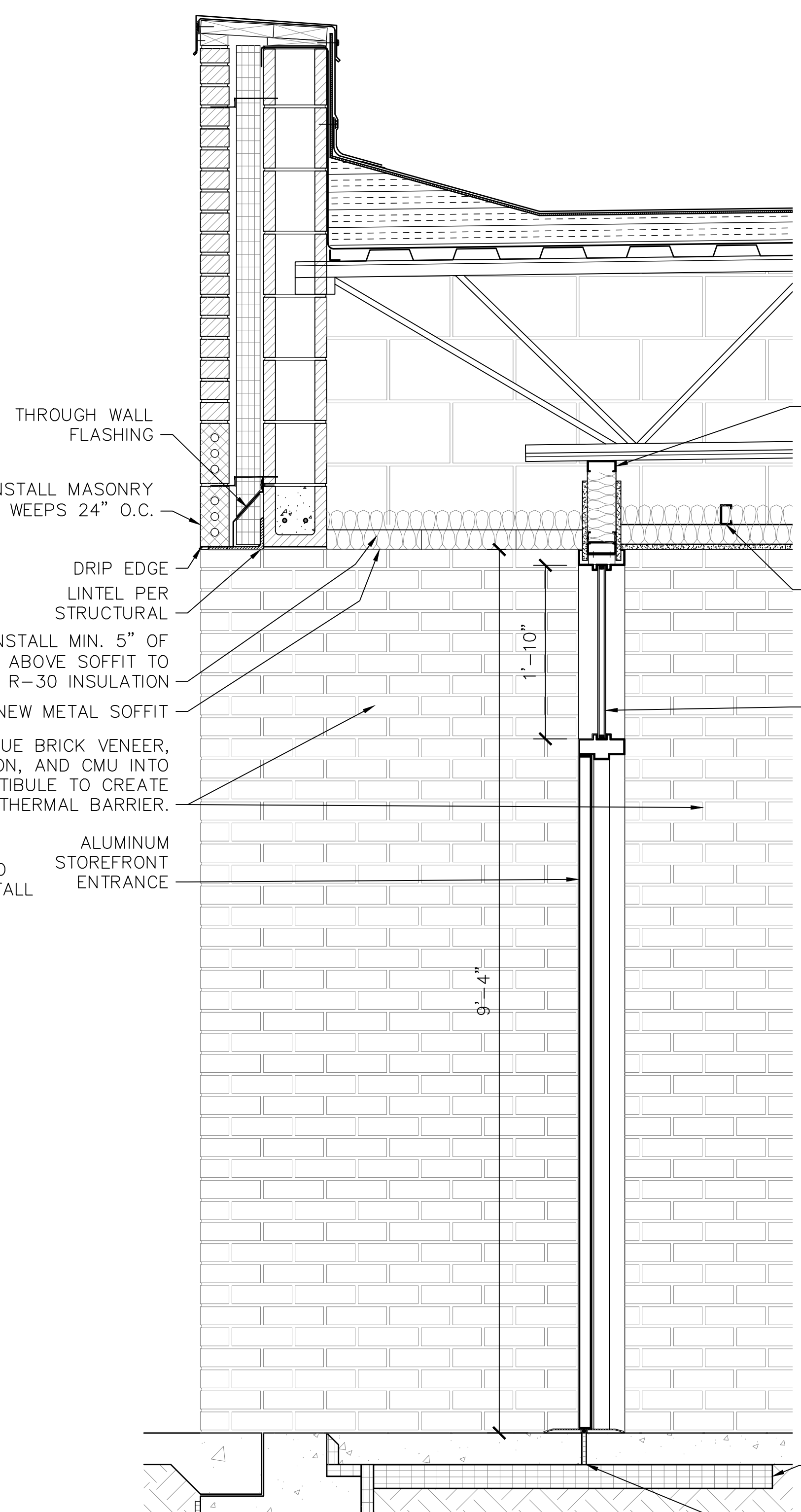
6
 A-502
NEW DOOR INFILL ELEVATION
 SCALE: 1' = 1'-0"



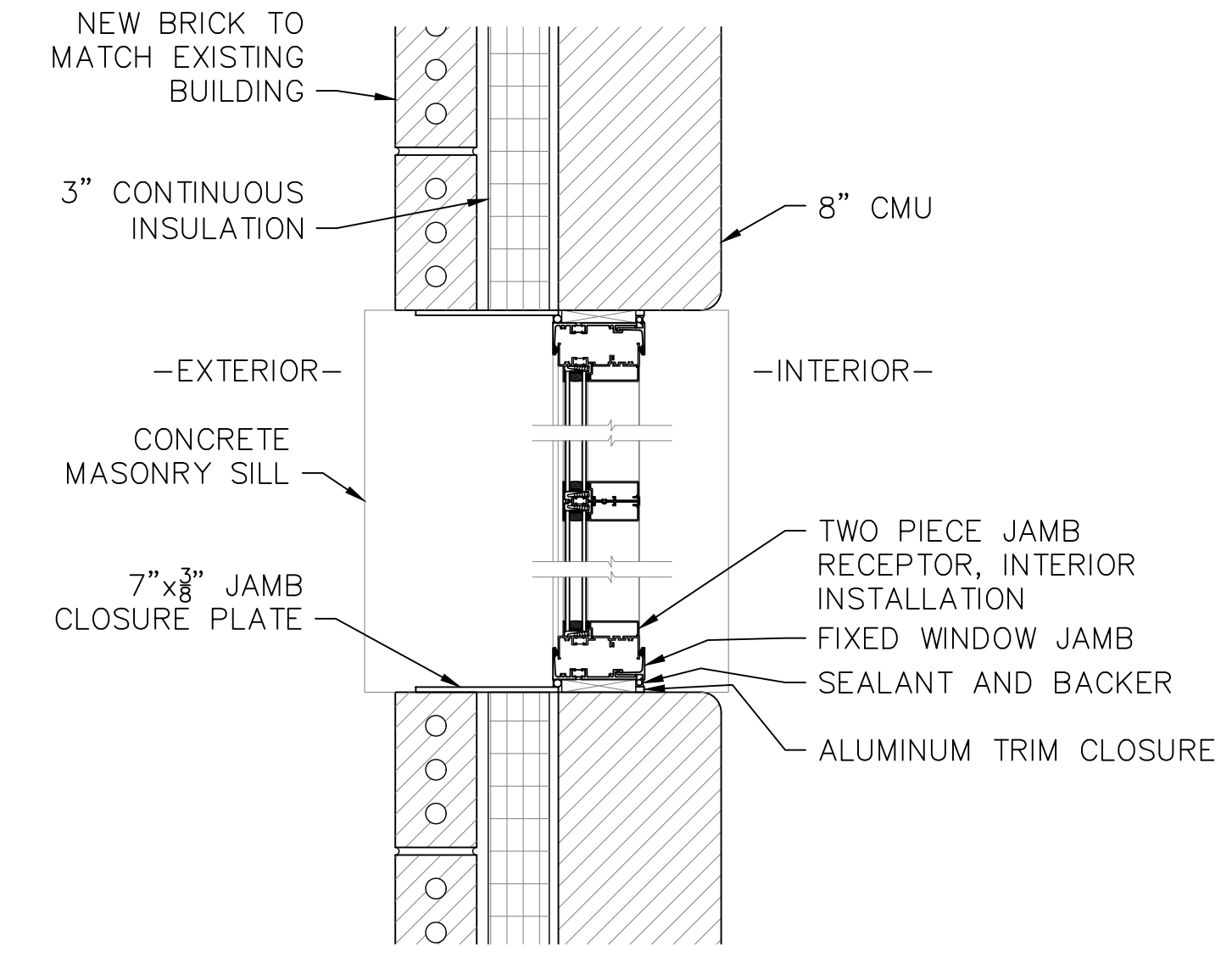
4
 A-502
NEW DOOR INFILL ELEVATION
 SCALE: 1' = 1'-0"



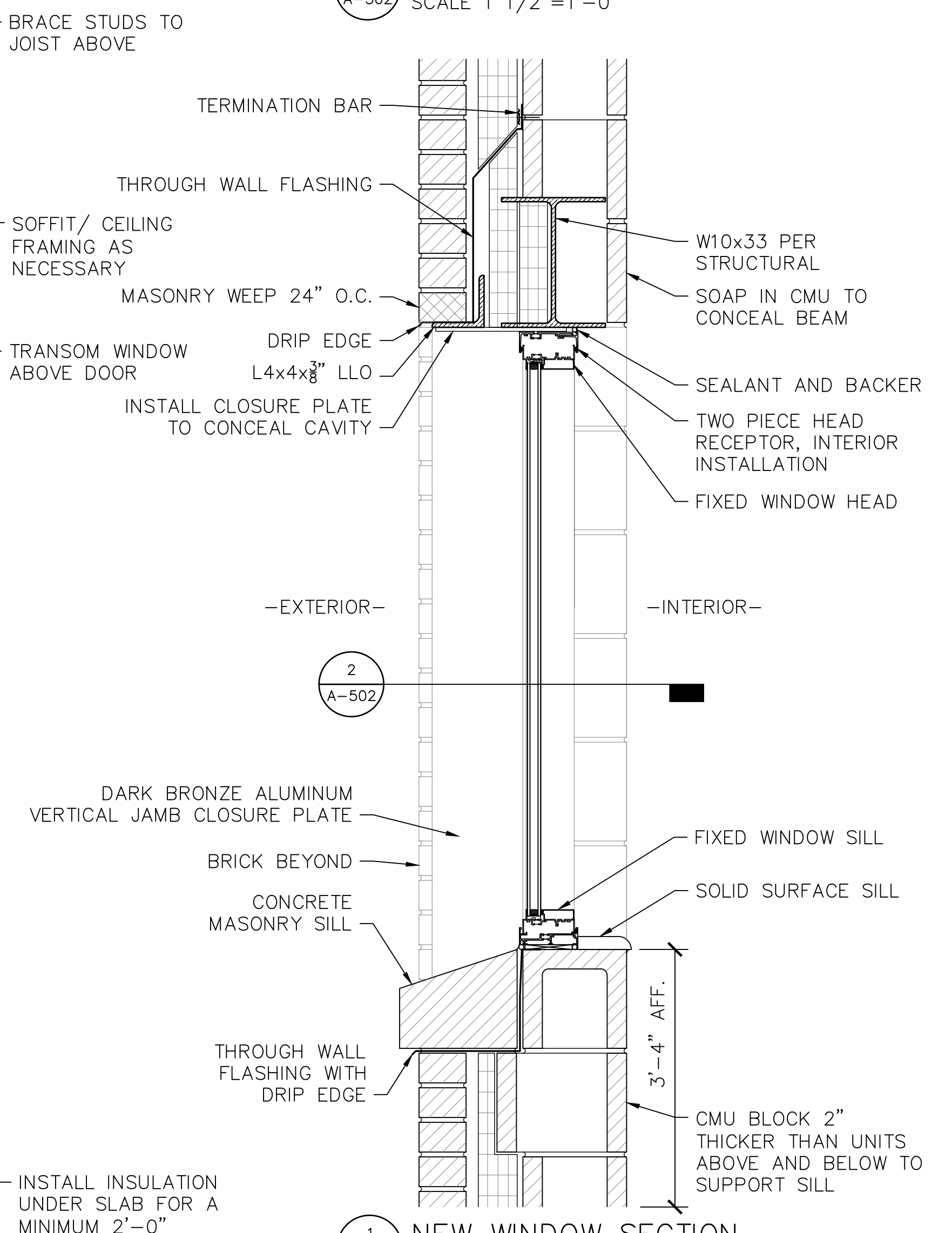
5
 A-502
NEW DOOR INFILL SECTION
 SCALE: 1' = 1'-0"



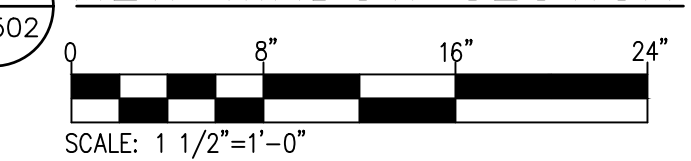
3
 A-502
NEW ENTRANCE SECTION
 SCALE: 1' = 1'-0"



2
 A-502
NEW HORIZONTAL WINDOW SECTION
 SCALE 1 1/2" = 1'-0"



2
 A-502
NEW WINDOW SECTION
 SCALE: 1 1/2" = 1'-0"



DOOR SCHEDULE – WASHTENAW ARMORY

DOOR NO.	DOOR SIZE	NEW/EXST/REN	DOOR MATERIAL	DOOR FINISH	ELEVATION	FRAME TYPE	FRAME MATL	FRAME FINISH	HEAD	JAMB	HDW SET	FIRE RATING (MIN.)	REMARKS
121	3'-0"x7'-0"x1-3/4"	EXST	HM	PT	-	EXST	HM	PT	-	-	EXST		
123	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	12		
124	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	12		
125	(2) 3'-0"x7'-0"x1-3/4"	NEW	HM	PT	E	NEW	HM	PT	2/A-601	2/A-601	3	60	
129	3'-0"x7'-0"x1-3/4"	NEW	GALV	PT	A	NEW	GALV	PT	2/A-601	2/A-601	1		
133A	(2) 3'-0"x7'-0"x1-3/4"	NEW	HM	PT	E	NEW	HM	PT	2/A-601	2/A-601	3	60	
133B	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	9	60	
133C	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	8	60	
140	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	7		
145A	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	7		
145B	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	7		
146A	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	7		
146B	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
146C	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
146D	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
146E	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
146F	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
146G	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
147A	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	3/A-601	3/A-601	5		
147B	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
147C	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
147D	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
147E	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
147F	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
147G	2'-6"x7'-0"x1-3/4"	NEW	HM	PT	C	NEW	HM	PT	3/A-601	3/A-601	5		3
148	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	7		
149	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	10		
150A	3'-6"x7'-0"x1-3/4"	NEW	HM	PT	B	NEW	HM	PT	2/A-601	2/A-601	11		
150B	4'-0"x7'-9"x1"	NEW	CAGE	FP	D	NEW	CAGE	FP	-	-	-		2
150C	4'-0"x7'-9"x1"	NEW	CAGE	FP	D	NEW	CAGE	FP	-	-	-		2
150D	4'-0"x7'-9"x1"	NEW	CAGE	FP	D	NEW	CAGE	FP	-	-	-		2
150E	4'-0"x7'-9"x1"	NEW	CAGE	FP	D	NEW	CAGE	FP	-	-	-		2
150F	4'-0"x7'-9"x1"	NEW	CAGE	FP	D	NEW	CAGE	FP	-	-	-		2
151	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	H	NEW	HM	PT	3/A-601	3/A-601	4		
152	3'-0"x7'-0"x1-3/4"	NEW	VAULT	PT	F	NEW	VAULT	PT	-	-	13		
153	3'-0"x7'-2"x1-3/4"	NEW	ALUM.	PT	G	NEW	ALUM.	PT	-	-	2		1
154	3'-0"x7'-2"x1-3/4"	NEW	ALUM.	PT	G	NEW	ALUM.	PT	-	-	1		1
155	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	A	NEW	HM	PT	2/A-601	2/A-601	7		
160	3'-0"x7'-0"x1-3/4"	NEW	HM	PT	I	NEW	HM	PT	3/A-601	3/A-601	4		1

HARDWARE SCHEDULE:

PROVIDE LEVER HANDLE LOCK SETS BORED TYPE TO MATCH BUILDING STANDARD, UNLESS NOTED OTHERWISE.

ALL SPECIAL LOCKING HARDWARE (KEYCARD, ETC.) MUST COMPLY WITH NFPA 101 7.2.1.5.1: DOOR LEAVES SHALL BE ARRANGED TO BE OPENED READILY FROM THE EGRESS SIDE WHENEVER THE BUILDING IS OCCUPIED AND NFPA 7.2.1.5.10: A LATCH OR OTHER FASTENING DEVICE ON A DOOR LEAF SHALL BE PROVIDED WITH A RELEASING DEVICE THAT HAS AN OBVIOUS METHOD OF OPERATION AND THAT IS READILY OPERATED UNDER ALL LIGHTING CONDITIONS.

HARDWARE:

REFER TO SPECIFICATION SECTION 08 71 00 FOR HARDWARE SCHEDULE

LEGEND:

- HM HOLLOW METAL
- PT PAINTED – SHERWIN WILLIAMS "ALTITUDE GRAY" SW 7060
- AL ALUMINUM FACTORY FINISHED
- ANOD ANODIZED
- GALV GALVANIZED
- FP FACTORY PAINTED

REMARKS:

1. INSULATED LAMINATED TINTED GLASS
2. PROVIDE PADLOCK LUG FOR CAGE DOOR
3. PROVIDE OCCUPANCY INDICATOR SIMILAR TO 'BEST C3FK'. REFER TO HARDWARE SCHEDULE 08 71 00.



STATE OF MICHIGAN
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PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th ST.
Royal Oak, MI 48067
248.542.7866 / www.dhfa.com

PROJECT
RENOVATE ARMORY WASHTENAW ARMORY

DESIGNED
DATE
04/01/2022

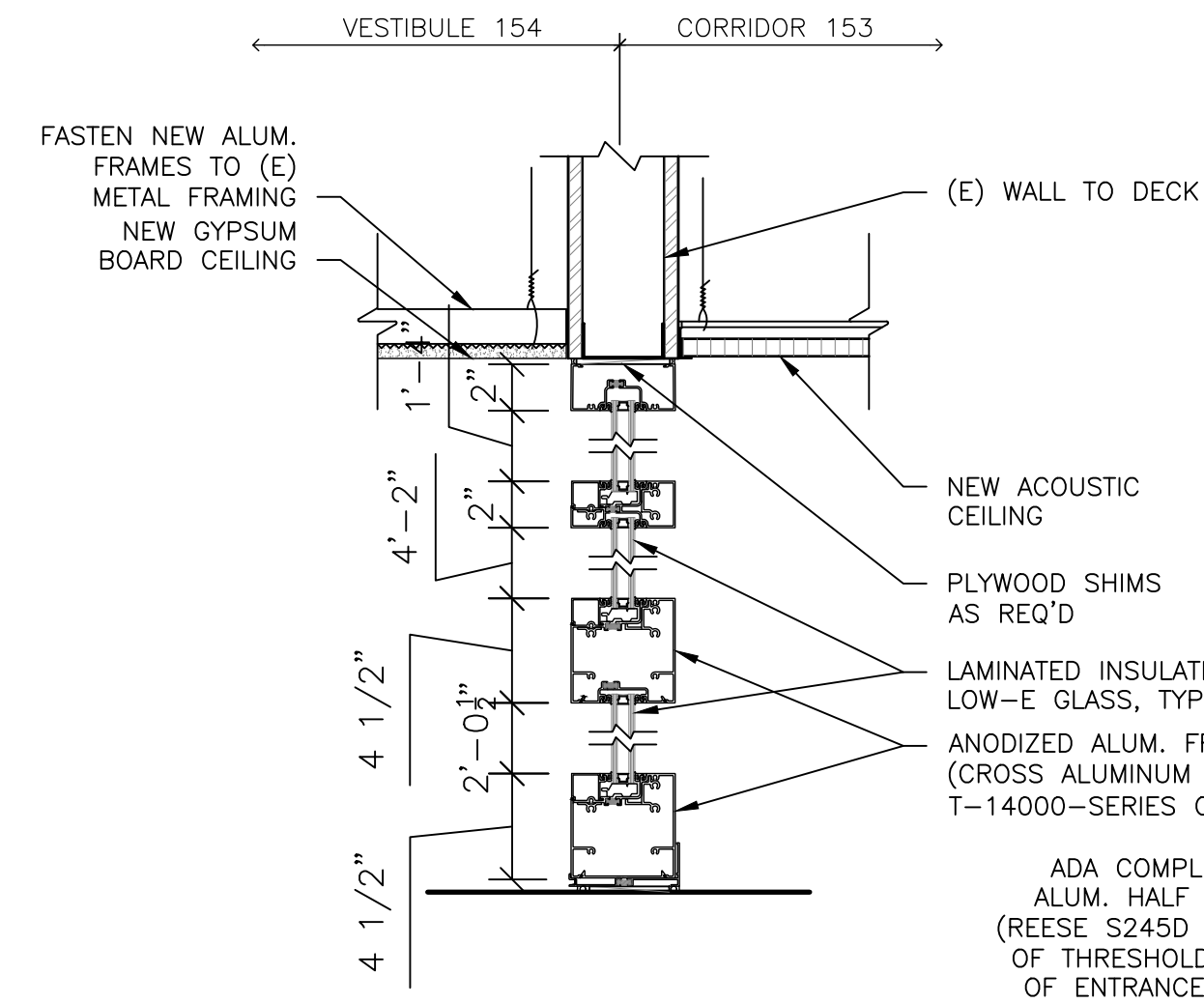
ISSUED FOR
CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTENAW ARMORY
CONTRACT NUMBER: 121456
FILE NO. 511/2126/CAK
DMA PROJECT NO. 2668022016

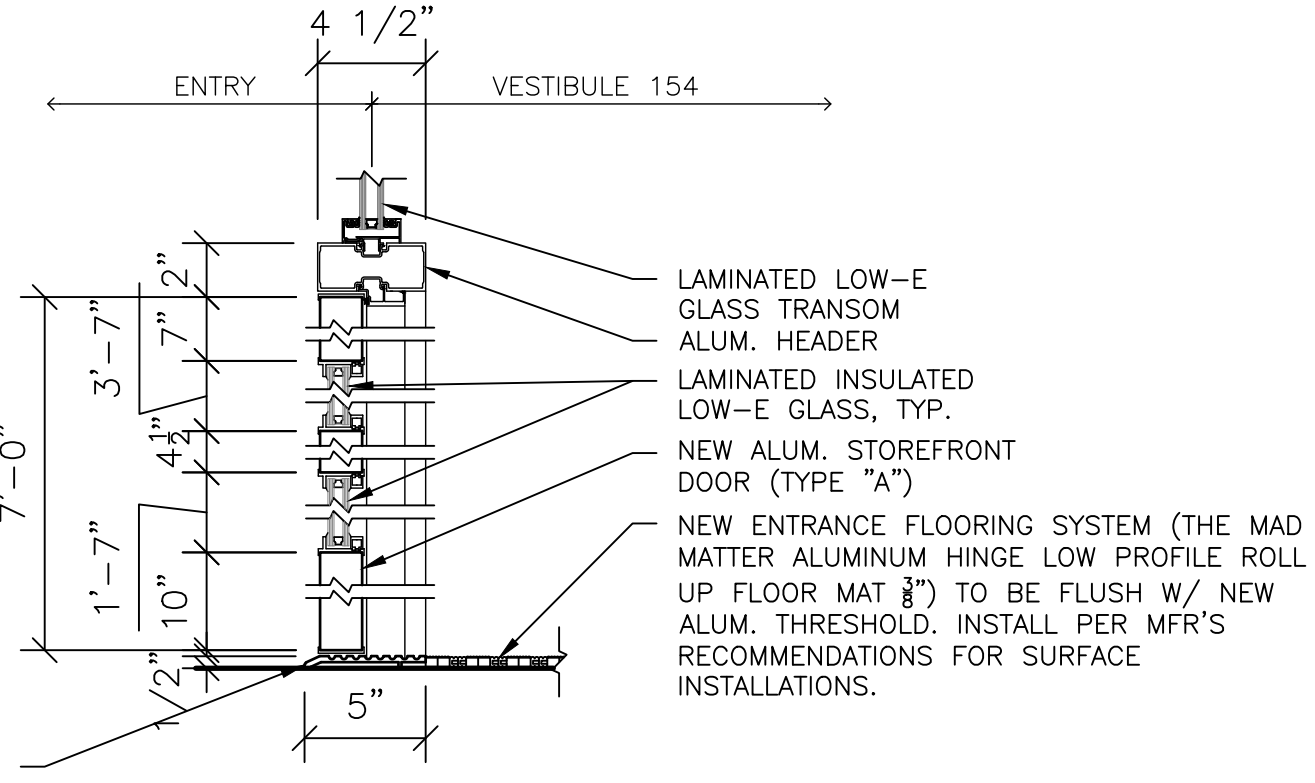
SHEET NUMBER
51 OF 96

DRAWING TITLE
DOOR SCHEDULE

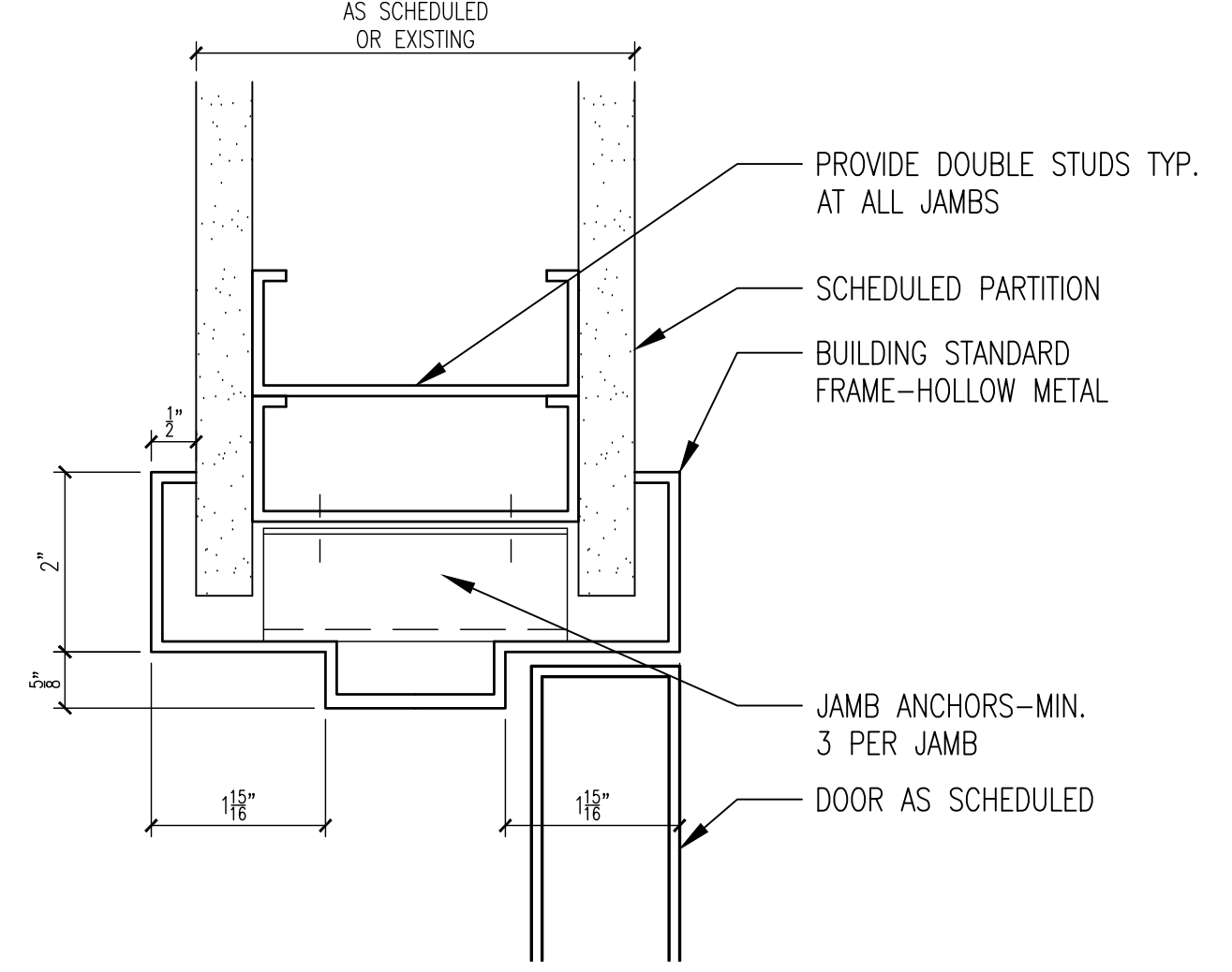
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A-601



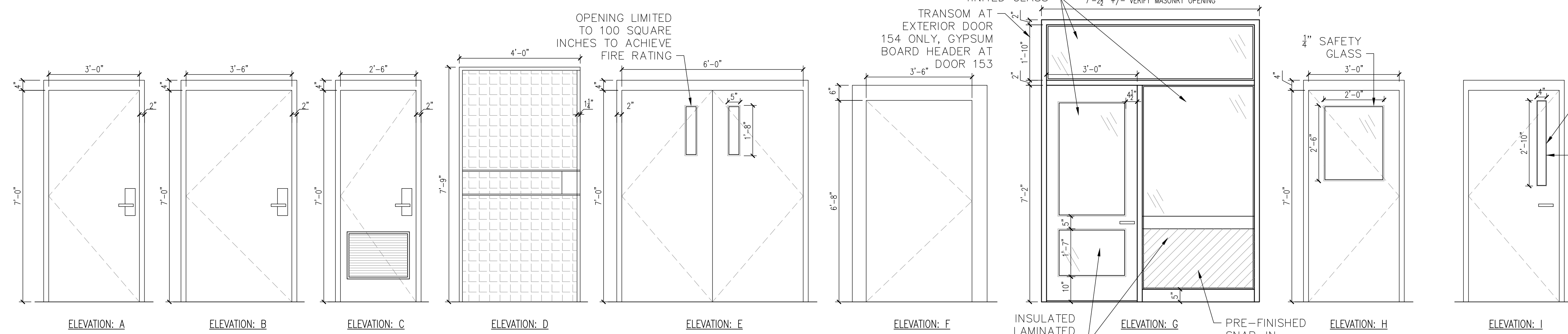
5 SECTION AT DOOR 153
SCALE: 1/2"=1'-0"



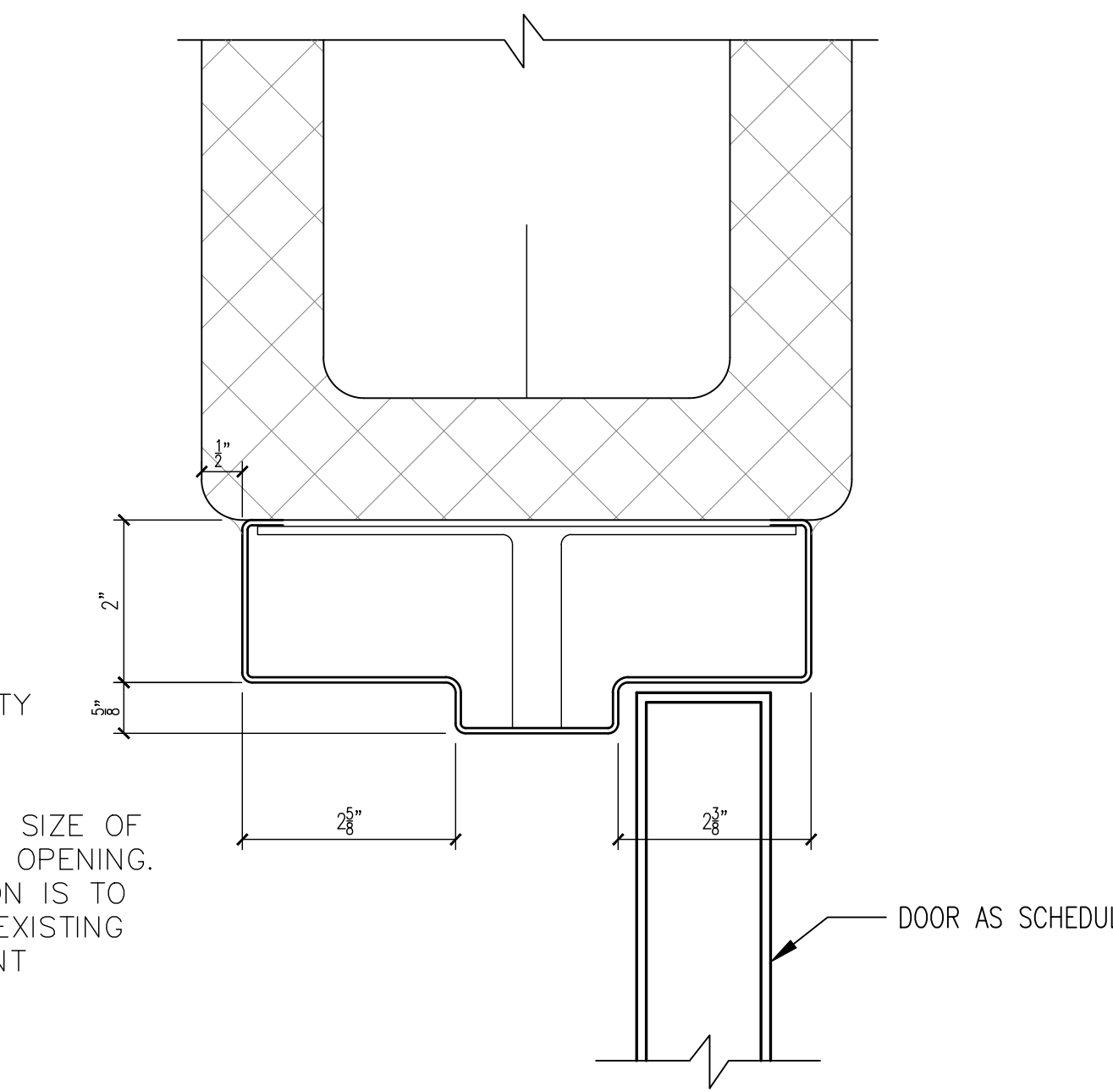
4 SECTION AT DOOR 154
SCALE: 1 1/2"=1'-0"



3 GYP. BD. WALL - DOOR HEAD (JAMB SIMILAR)
SCALE: 6"=1'-0"



1 DOOR ELEVATIONS
SCALE: 1/2"=1'-0"



2 CMU WALL DOOR HEAD (JAMB SIMILAR)
SCALE: 6"=1'-0"

9: \2021\2021-0363-00\CAD\2021-0363-MD-IND.dwg, M-001, 3/25/2022 2:13:41 PM, Devin J. Senefeld, Peter Basso Associates Inc.

MECHANICAL ABBREVIATION LIST

Table with 4 columns: ABBREVIATION, DESCRIPTION, ABBREVIATION, DESCRIPTION. Lists various mechanical components and their abbreviations.

TEMPERATURE CONTROL - PARTIAL SYMBOLS LIST

Table with 4 columns: SYMBOL, DESCRIPTION, SYMBOL, DESCRIPTION. Lists symbols for temperature control components like sensors and valves.

NOTE: LIST OF ADDITIONAL SYMBOLS & ABBREVIATIONS ASSOCIATED WITH TEMPERATURE CONTROLS ARE IDENTIFIED ON TC DRAWINGS.

MECHANICAL SYMBOL LIST

Table with 2 columns: SYMBOL, DESCRIPTION. Lists symbols for piping and ductwork components.

Table with 2 columns: SYMBOL, DESCRIPTION. Lists symbols for double line piping components.

DUCTWORK SYMBOLS

Table with 2 columns: SYMBOL, DESCRIPTION. Lists symbols for ductwork components.

Table with 2 columns: SYMBOL, DESCRIPTION. Lists symbols for double line ductwork components.

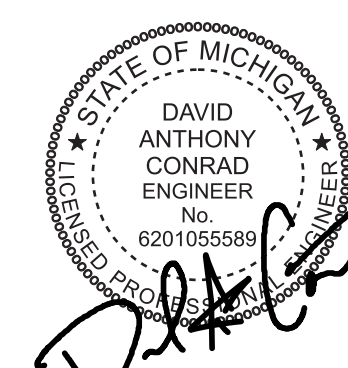
MECHANICAL DRAWING INDEX

Table with 2 columns: SHEET NO., SHEET TITLE. Lists sheet numbers and titles for the mechanical drawing index.

STANDARD METHODS OF NOTATION

Diagram showing various notation symbols and their corresponding descriptions, including supply diffusers, registers, elbows, and ductwork details.

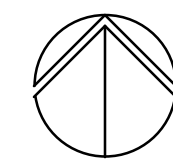
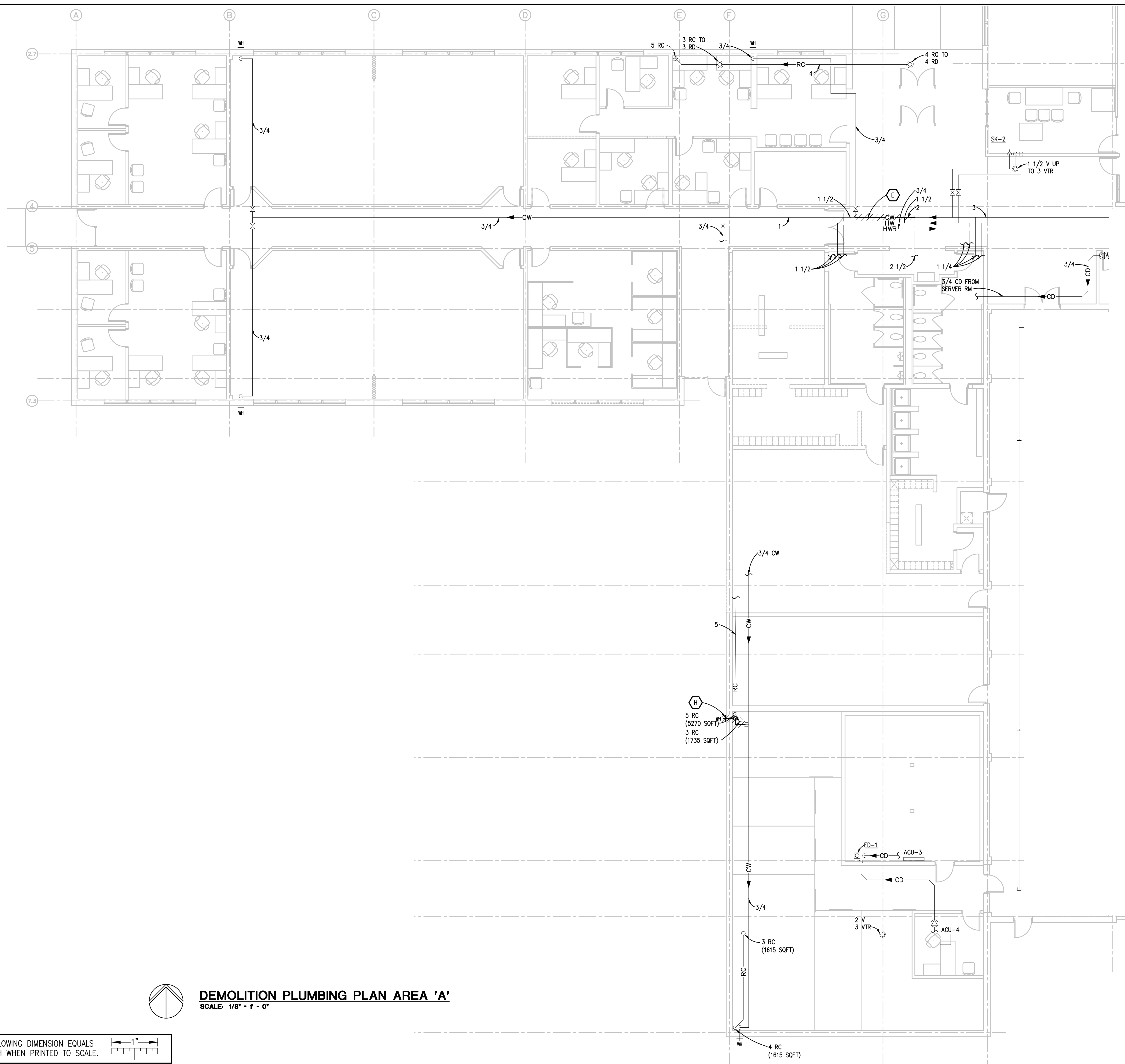
NOTE: SOME SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.



Peter Basso Associates Inc. CONSULTING ENGINEERS. 5145 Livernois, Suite 100, Troy, Michigan 48069-3276.

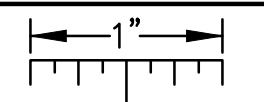
Vertical sidebar containing project information: PROJECT (RENOVATE ARMORY WASHTEWAW ARMORY), DESIGNED (RLT), DRAWN (CHECKED DAC), DATE (04/01/2022), ISSUED FOR (CONSTRUCTION DOCUMENTS), IDENTIFICATION NUMBER (CONTRACT NUMBER: Y21456), SHEET NUMBER (52 OF 96), DRAWING TITLE (MECHANICAL STANDARDS AND DRAWING INDEX), and DRAWING NUMBER (M-001).

9:\2021\2021-0363-00\CAD\2021-0363-MD2-PL.dwg, MD-201A, 3/25/2022 2:13:48 PM, Devin J. Senechal, Peter Basso Associates Inc.



DEMOLITION PLUMBING PLAN AREA 'A'
SCALE: 1/8" = 1' - 0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



MECHANICAL DEMOLITION GENERAL NOTES:

- ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
- THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
- THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
- ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

DEMOLITION KEY NOTES:

- REMOVE EXISTING 3" SANITARY BACK TO MAIN AND CAP. REMOVE EXISTING 2" VENT COMPLETE BACK TO NEAREST BRANCH.
- REMOVE EXISTING 3" SANITARY COMPLETE. PREPARE FOR RECONNECTION OF NEW 4" SANITARY. SEE SHEET M-501 FOR CONTINUATION OF NEW PIPING.
- REMOVE EXISTING FLOOR DRAIN COMPLETE AND PREPARE FOR NEW CONNECTION.
- REMOVE EXISTING CW AND TW PIPING BACK TO SOURCE AND CAP. REMOVE EXISTING SHOWER HEADS AND COMPONENTS COMPLETE. PATCH WALL TO MATCH EXISTING.
- REMOVE PIPING AS INDICATED AND PREPARE EXISTING PIPING TO REMAIN FOR NEW CONNECTION.
- REMOVE EXISTING JANITORS CLOSET SINK AND FAUCET COMPLETE. REMOVE EXISTING COLD WATER PIPING, INSULATION, HANGERS, AND VALVES BACK TO LOCATION INDICATED AND CAP. REMOVE EXISTING HOT WATER CONNECTION BACK TO MAIN. REMOVE EXISTING VENT PIPING BACK TO LOCATION INDICATED AND CAP. REPAIR WALL TO MATCH EXISTING. REMOVE SANITARY TO BELOW FLOOR AND CAP. REPAIR FLOOR TO MATCH EXISTING.
- REMOVE CONDENSATE DRAIN TO LOCATION INDICATED. PREPARE EXISTING PIPING FOR NEW CONNECTION, REFER TO NEW WORK PLANS.
- REMOVE FIXTURE COMPLETE AND CAP AT MAIN.

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th ST. 48067
248.642.7666/www.pba.com
FORBES
CONSULTING ENGINEERS

PROJECT
RENOVATE ARMORY WASHTEAW
ARMORY

DESIGNED
DRAWN BPC
CHECKED RLK
APPROVED DAC

DATE
04/01/2022

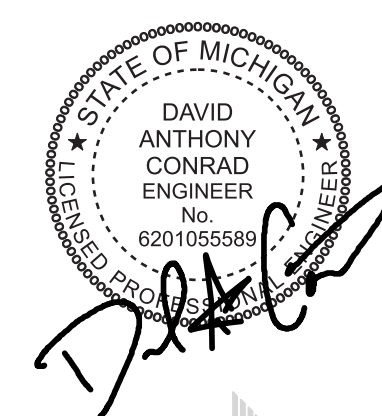
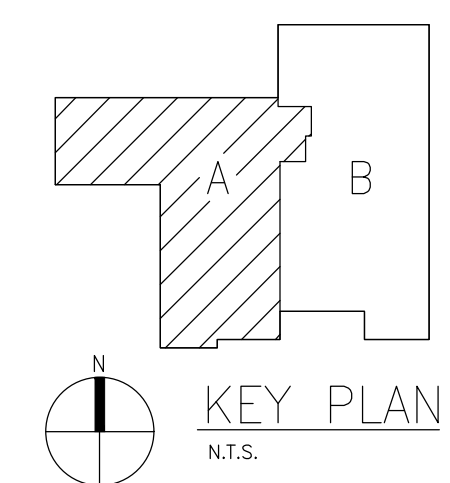
ISSUED FOR
CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTEAW ARMORY
CONTRACT NUMBER: Y2146
FILE NO. 511/21326.0AK
DMA PROJECT NO. 263802016

SHEET NUMBER
53 OF 96

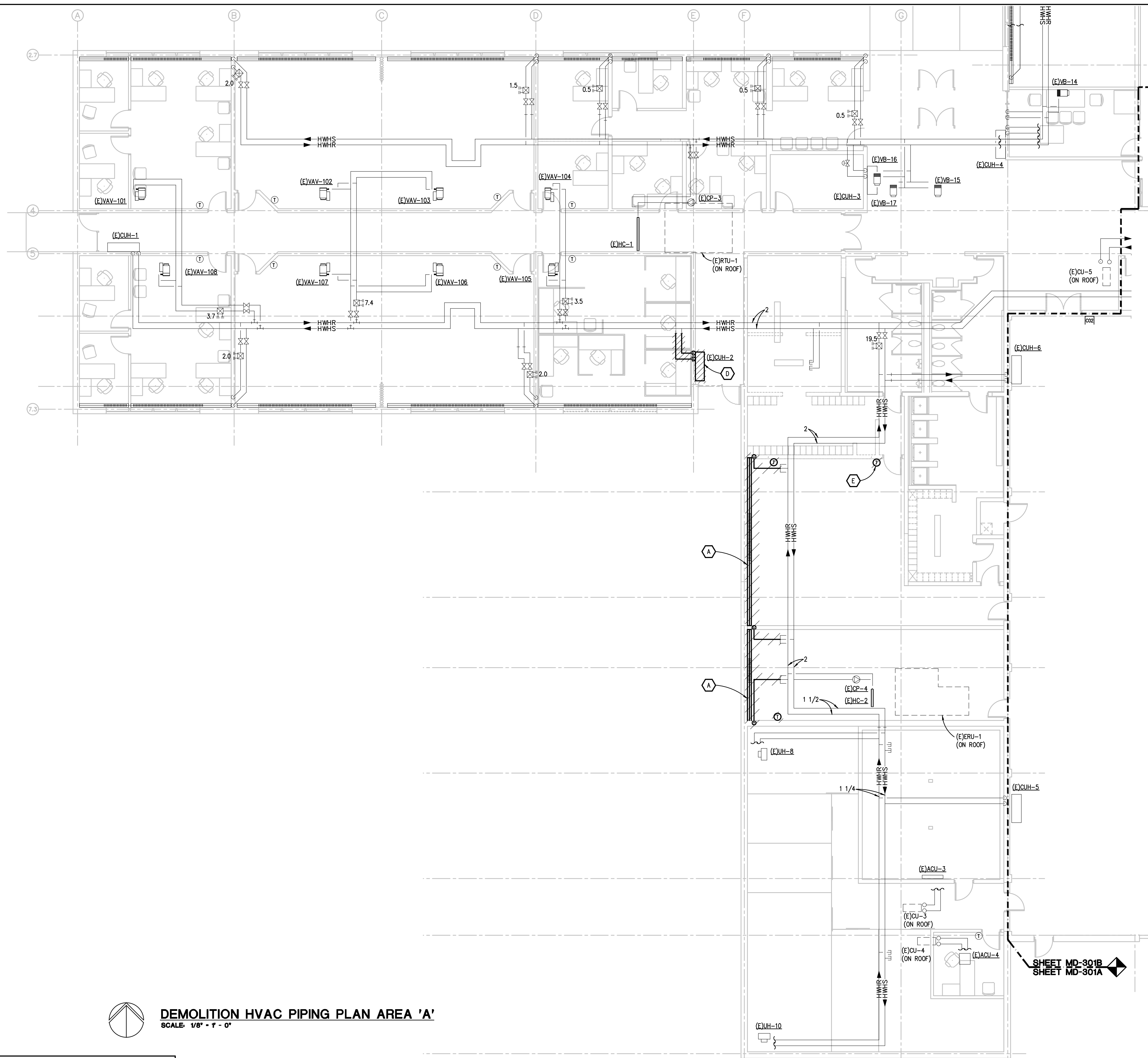
DRAWING TITLE
DEMOLITION PLUMBING PLAN AREA 'A'

DRAWING NUMBER
MD-201A



Peter Basso Associates Inc.
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PBA Project No. 0021036

9:\2021\2021-0363-00\CAD\2021-0363-MD3-HP.dwg, MD-301A, 3/25/2022 2:15:55 PM, Devin J. Senechal, Peter Basso Associates Inc.



SHEET MD-301A
SHEET MD-301B

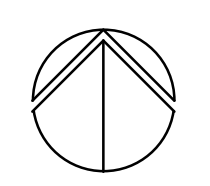
SHEET MD-301B
SHEET MD-301A

**MECHANICAL DEMOLITION
GENERAL NOTES:**

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2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

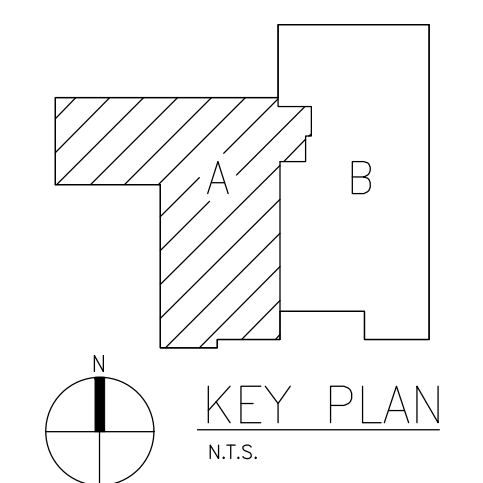
DEMOLITION KEY NOTES:

- A. REMOVE EXISTING FINNED TUBE RADIATOR, THERMOSTAT, CONTROL VALVES, PIPING, INSULATION, HANGERS, AND ASSOCIATED COMPONENTS BACK TO MAIN OR INDICATED. CAP PIPING AT MAIN.
- B. REMOVE AND RELOCATE EXISTING HOT WATER TERMINAL UNIT, THERMOSTAT. REFER TO NEW WORK PLAN FOR NEW LOCATION. REMOVE EXISTING HOT WATER HEATING PIPING, INSULATION, HANGERS, AND ASSOCIATED COMPONENTS COMPLETE.
- C. REMOVE EXISTING HOT WATER UNIT HEATER, THERMOSTAT, HOT WATER HEATING PIPING, INSULATION, HANGERS, AND ASSOCIATED COMPONENTS COMPLETE. PREPARE PIPING FOR NEW CONNECTION.
- D. REMOVE EXISTING CABINET UNIT HEATER, SUPPORTS, THERMOSTAT, ELECTRICAL CONNECTION, PIPE INSULATION, VALVES, AND PIPING BACK TO MAIN AND CAP.
- E. REMOVE AND RELOCATE EXISTING ERU THERMOSTAT TO LOCATION INDICATED ON NEW WORK PLAN.



DEMOLITION HVAC PIPING PLAN AREA 'A'
SCALE: 1/8" = 1'-0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



STATE OF MICHIGAN
DAVID ANTHONY CONRAD
ENGINEER
No. 6201055589

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www.PeterBassoAssociates.com
PBA Project No. 0021036

DRAWING NUMBER MD-301A	DRAWING TITLE DEMOLITION HVAC PIPING PLAN AREA 'A'	SHEET NUMBER 54 OF 96	IDENTIFICATION NUMBER PROJECT: WASHTEENAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.GAK DMA PROJECT NO. 263802016	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED RLT	PROJECT RENOVATE ARMORY WASHTEENAW ARMORY
	DATE 04/01/2022	DESIGNED RLT	PROJECT RENOVATE ARMORY WASHTEENAW ARMORY	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED RLT	PROJECT RENOVATE ARMORY WASHTEENAW ARMORY

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ADAM P. LACH, RA, DIRECTOR

816 E 4th ST.
ANN ARBOR MI 48107
248.942.7666/www.pba.com

FORBES
CONSULTING ENGINEERS

PROJECT
RENOVATE ARMORY WASHTEENAW ARMORY

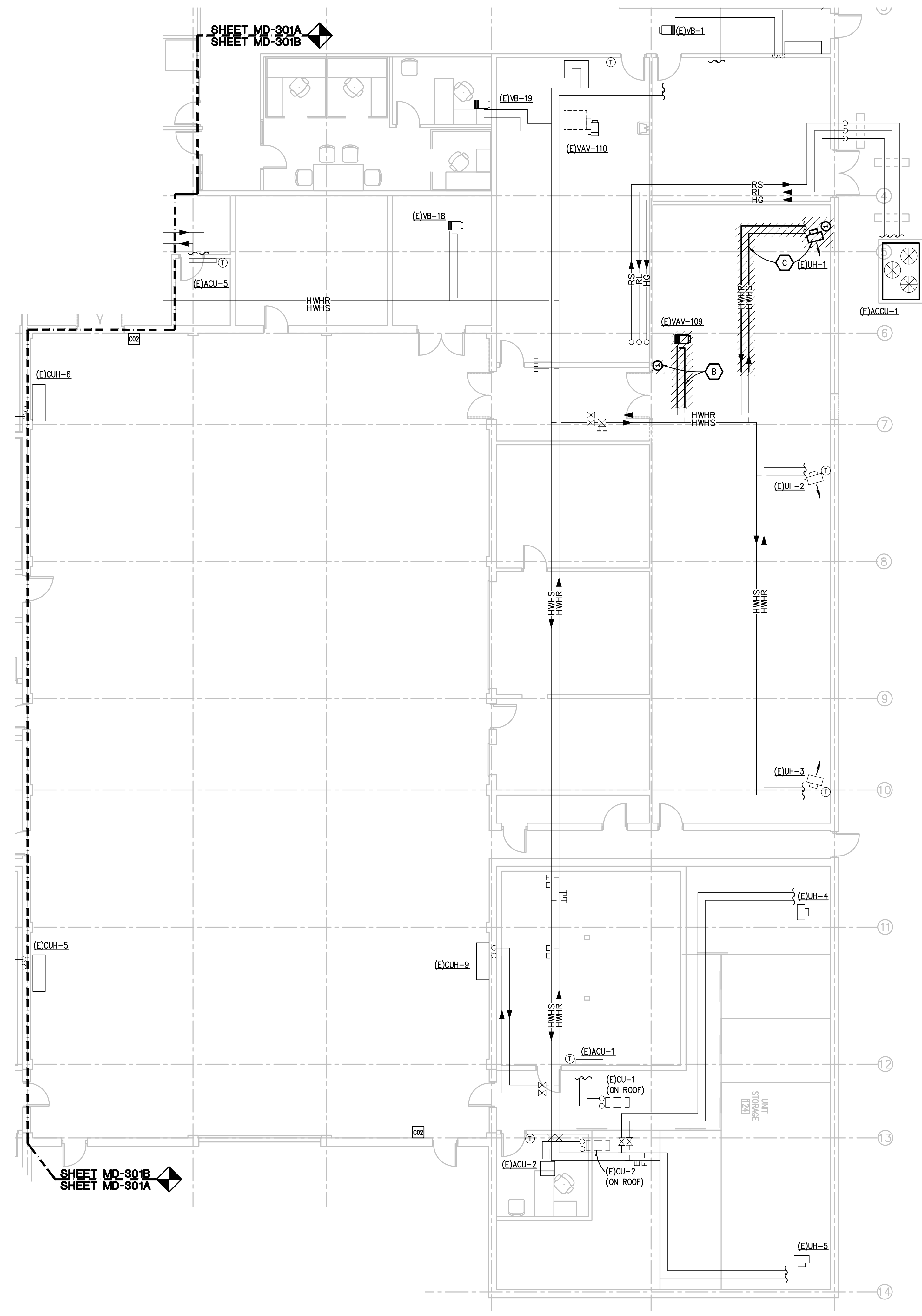
DESIGNED
RLT

ISSUED FOR
CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTEENAW ARMORY
CONTRACT NUMBER: Y21456
FILE NO. 511/21326.GAK
DMA PROJECT NO. 263802016

DRAWING NUMBER
MD-301A

9: /2021/2021-0363-00\CAD\2021-0363-MD3-HP.dwg, MD-301B, 3/25/2022 2:13:56 PM, Devin J. Senechal, Peter Basso Associates Inc.



DEMOLITION HVAC PIPING PLAN AREA 'B'
SCALE: 1/8" = 1' - 0"

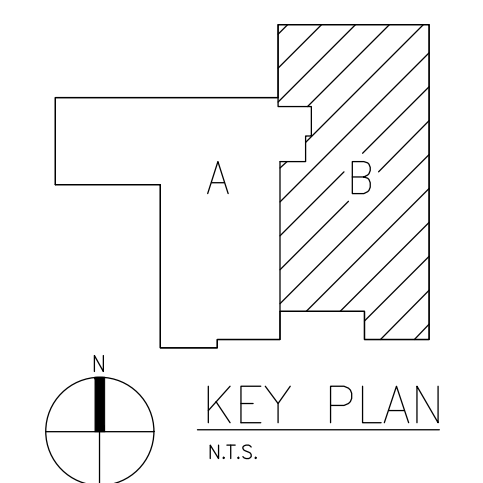
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

MECHANICAL DEMOLITION GENERAL NOTES:

1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

DEMOLITION KEY NOTES:

- A. REMOVE EXISTING FINNED TUBE RADIATOR, THERMOSTAT, CONTROL VALVES, PIPING, INSULATION, HANGERS, AND ASSOCIATED COMPONENTS BACK TO MAIN OR INDICATED. CAP PIPING AT MAIN.
- B. REMOVE AND RELOCATE EXISTING HOT WATER TERMINAL UNIT, THERMOSTAT. REFER TO NEW WORK PLAN FOR NEW LOCATION. REMOVE EXISTING HOT WATER HEATING PIPING, INSULATION, HANGERS, AND ASSOCIATED COMPONENTS COMPLETE.
- C. REMOVE EXISTING HOT WATER UNIT HEATER, THERMOSTAT, HOT WATER HEATING PIPING, INSULATION, HANGERS, AND ASSOCIATED COMPONENTS COMPLETE. PREPARE PIPING FOR NEW CONNECTION.
- D. REMOVE EXISTING CABINET UNIT HEATER, SUPPORTS, THERMOSTAT, ELECTRICAL CONNECTION, PIPE INSULATION, VALVES, AND PIPING BACK TO MAIN AND CAP.
- E. REMOVE AND RELOCATE EXISTING ERU THERMOSTAT TO LOCATION INDICATED ON NEW WORK PLAN.

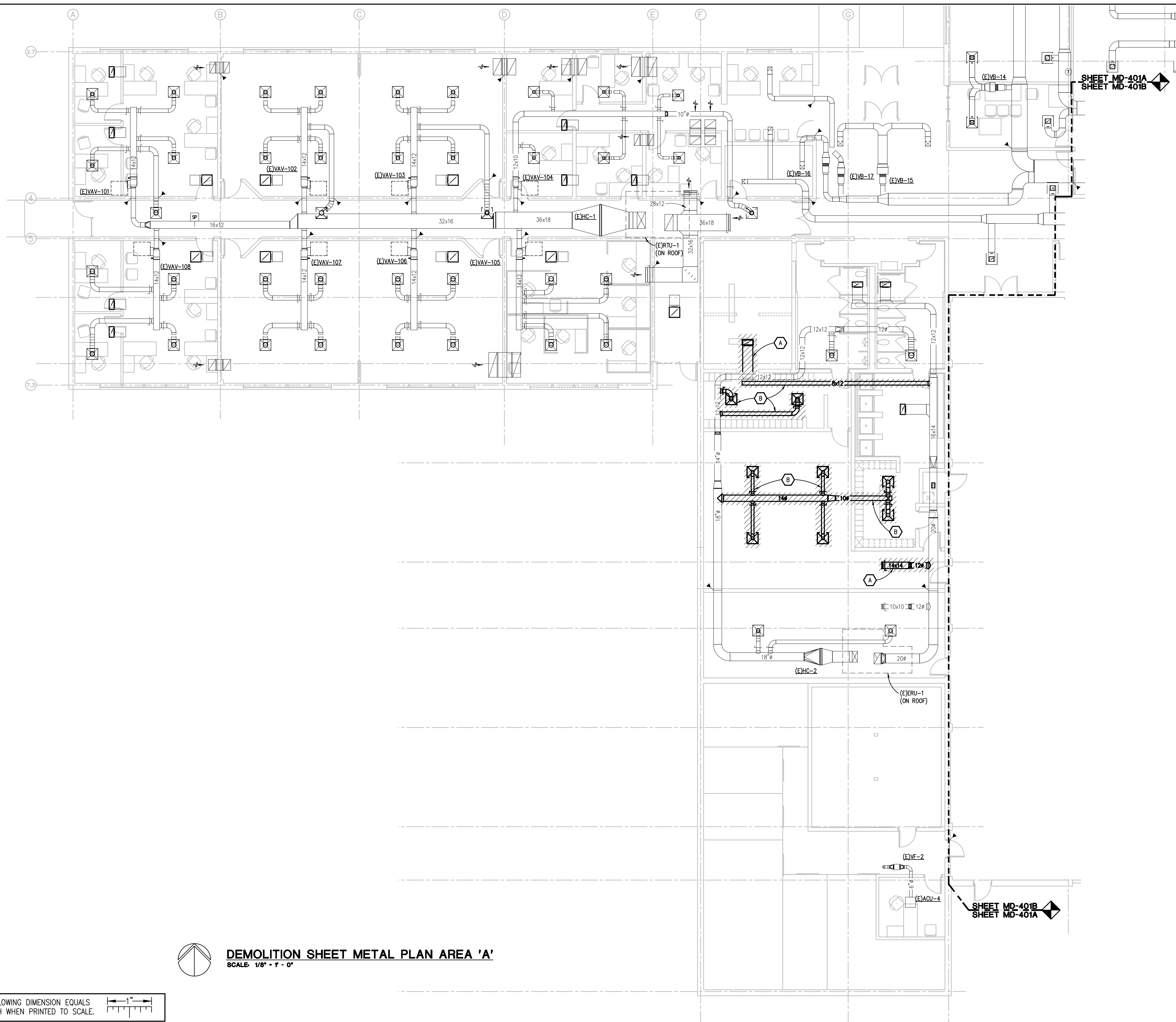


STATE OF MICHIGAN
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No. 6201055589

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PBA Project No. 20210363

DRAWING NUMBER	MD-301B
	55 OF 96
DRAWING TITLE	DEMOLITION HVAC PIPING PLAN AREA 'B'
SHEET NUMBER	55 OF 96
IDENTIFICATION NUMBER	PROJECT: WASHTEENAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.CAK DMA PROJECT NO. 2658922016
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	RLT
DRAWN	CHECKED
PROJECT	RENOVATE ARMORY WASHTEENAW ARMORY
 816 E 4th ST. A8067 248-642-7666/www.phfoc.com	
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR	

9: \2021\2021-0363-00\CAD\2021-0363-MD4-SM.dwg, MD-401A, 3/25/2022 2:14:17 PM, Devin J. Senechal, Peter Basso Associates Inc.



MECHANICAL DEMOLITION GENERAL NOTES:

1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
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DEMOLITION KEY NOTES:

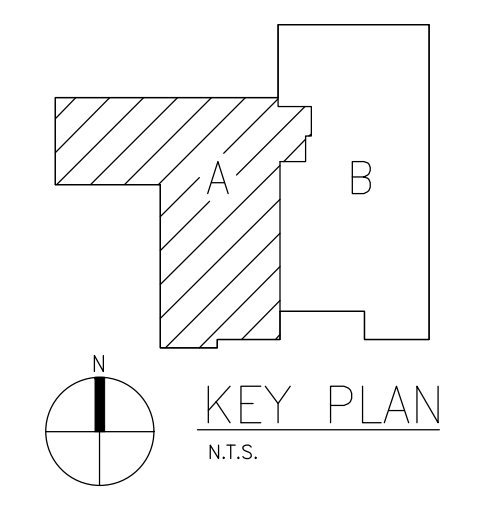
- A. REMOVE EXISTING EXHAUST AIR DUCTWORK, GRILLE, HANGERS, DAMPERS, AND ASSOCIATED COMPONENTS BACK TO MAIN AND CAP.
- B. REMOVE EXISTING SUPPLY AIR DUCTWORK, DIFFUSER, HANGERS, DAMPERS, AND ASSOCIATED COMPONENTS BACK TO MAIN AND CAP.
- C. REMOVE AND RELOCATE EXISTING HOT WATER TERMINAL UNIT, REFER TO NEW WORK PLANS FOR NEW LOCATION, REMOVE EXISTING DIFFUSER, VOLUME DAMPER, AND ASSOCIATED DUCTWORK AS INDICATED, PREPARE DUCTWORK FOR NEW CONNECTION.

DEMOLITION SHEET METAL PLAN AREA 'A'
SCALE: 1/8" = 1' - 0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

SHEET MD-401A
SHEET MD-401B

SHEET MD-401B
SHEET MD-401A

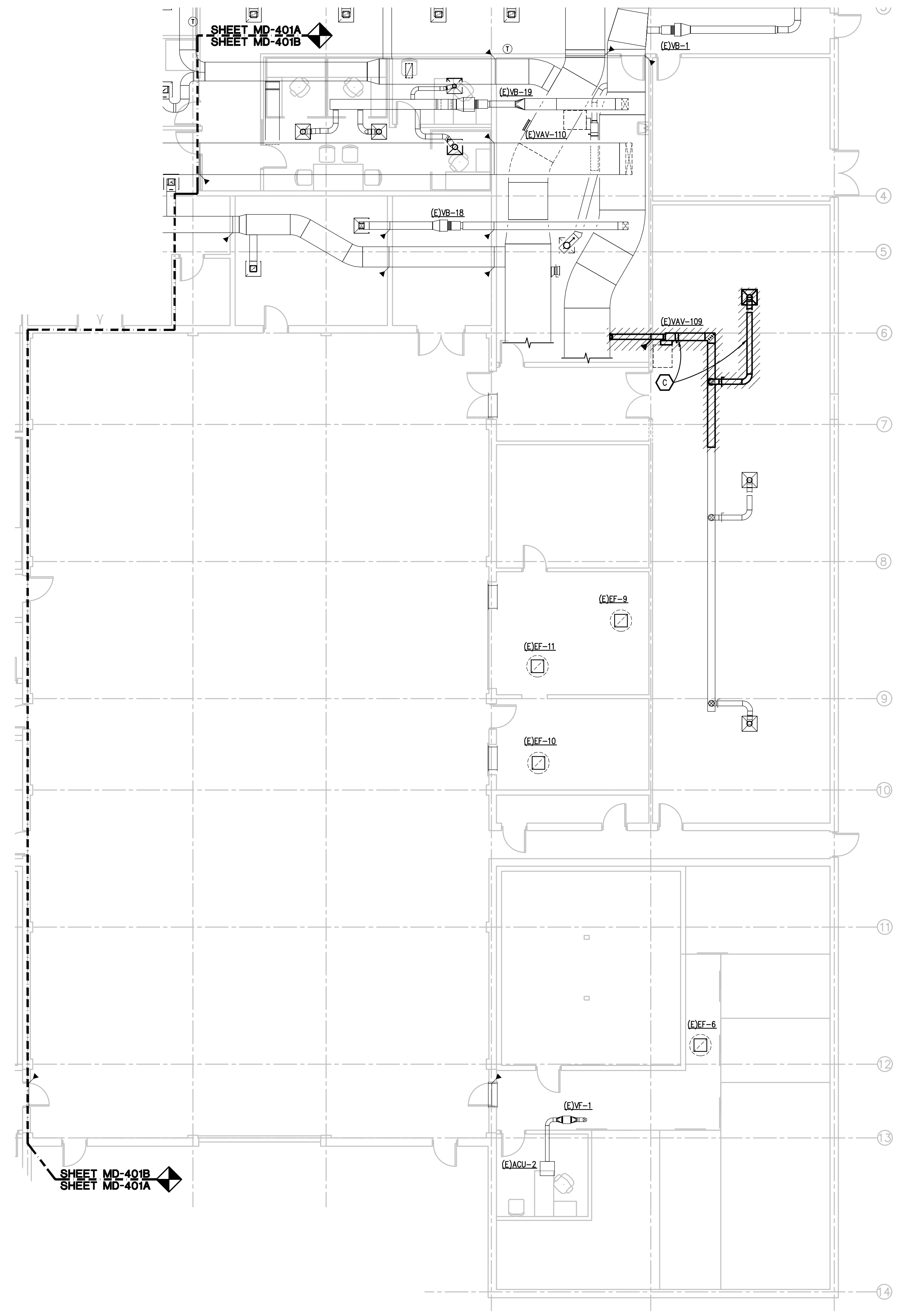


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DAVID ANTHONY CONRAD
ENGINEER
No. 6201055589

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Fax: 248-878-0007
www.PeterBassoAssociates.com
FSA Project No. 0021285

DRAWING NUMBER MD-401A	DRAWING TITLE DEMOLITION SHEET METAL PLAN AREA 'A'	SHEET NUMBER 56 OF 96	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED RLT	PROJECT RENOVATE ARMORY WASHTEENAW ARMORY	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR
							816 E 4th ST. 48067 248.842.7666/www.pba.com

9: 2021\2021-0363-00\CAD\2021-0363-MD4-SM.dwg, MD-401B, 3/25/2022 2:14:20 PM, Devin J. Senechal, Peter Basso Associates Inc.

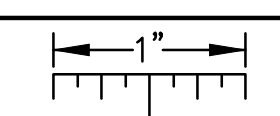


SHEET MD-401B
SHEET MD-401A

SHEET MD-401A
SHEET MD-401B



DEMOLITION SHEET METAL PLAN AREA 'B'
SCALE: 1/8" = 1'-0"



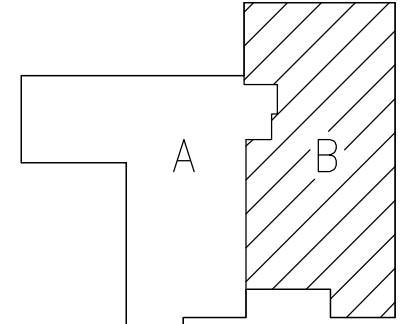
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

MECHANICAL DEMOLITION GENERAL NOTES:

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DEMOLITION KEY NOTES:

- A. REMOVE EXISTING EXHAUST AIR DUCTWORK, GRILLE, HANGERS, DAMPERS, AND ASSOCIATED COMPONENTS BACK TO MAIN AND CAP.
- B. REMOVE EXISTING SUPPLY AIR DUCTWORK, DIFFUSER, HANGERS, DAMPERS, AND ASSOCIATED COMPONENTS BACK TO MAIN AND CAP.
- C. REMOVE AND RELOCATE EXISTING HOT WATER TERMINAL UNIT, REFER TO NEW WORK PLANS FOR NEW LOCATION, REMOVE EXISTING DIFFUSER, VOLUME DAMPER, AND ASSOCIATED DUCTWORK AS INDICATED, PREPARE DUCTWORK FOR NEW CONNECTION.



KEY PLAN
N.T.S.



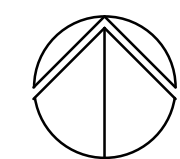
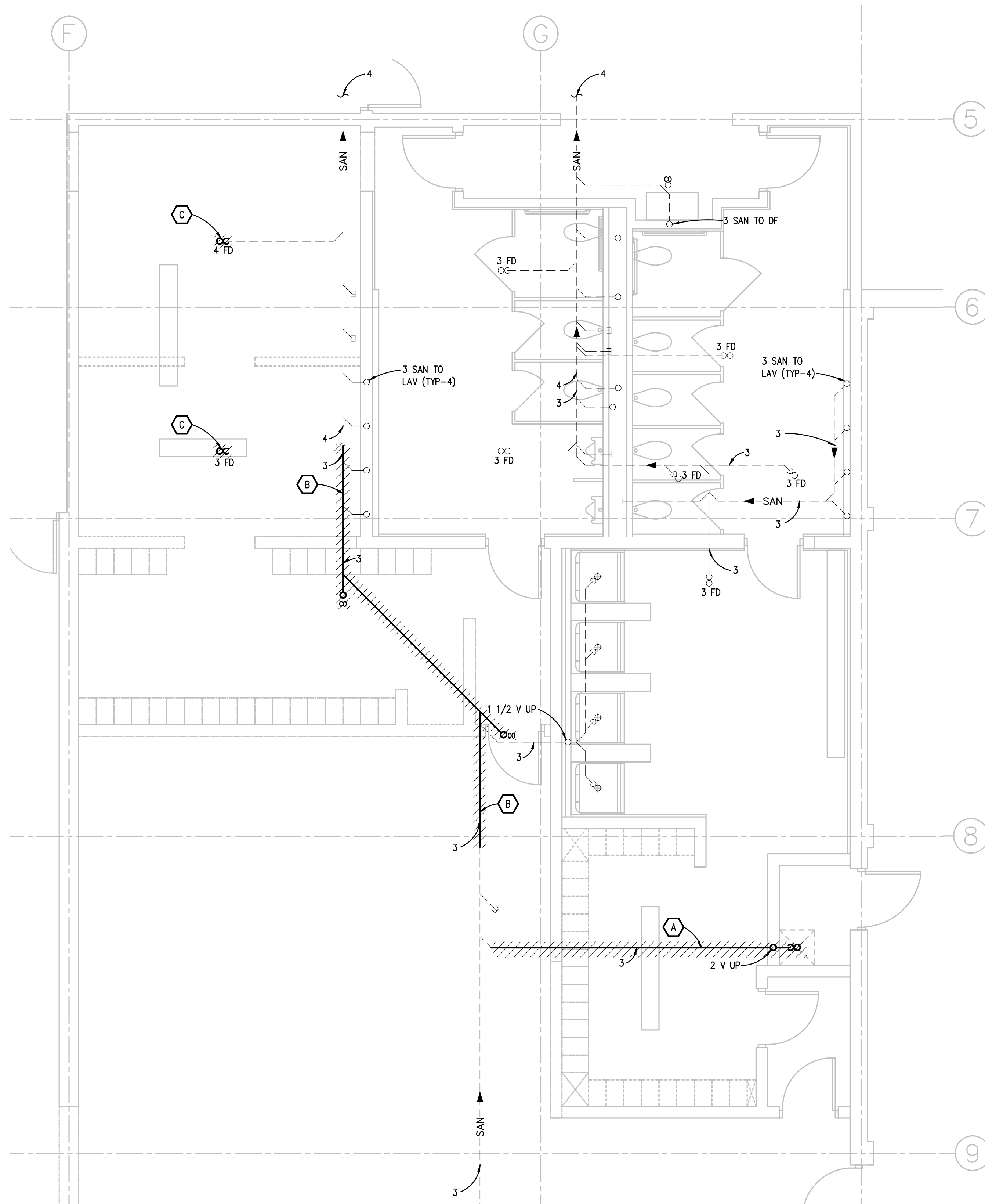
Peter Basso Associates Inc.
CONSULTING ENGINEERS
5145 Livernois, Suite 100
Troy, Michigan 48068-3276
Tel: 248-878-5556
Fax: 248-878-0007
www.PeterBassoAssociates.com
PBA Project No. 20210363

DRAWING NUMBER MD-401B	DRAWING TITLE DEMOLITION SHEET METAL PLAN AREA 'B'	SHEET NUMBER 57 OF 96	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED RLT	PROJECT RENOVATE ARMORY WASHTEAW ARMORY
	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21465 FILE NO. 511/21326.GAK DWG PROJECT NO. 2663822016		DRAWN CHECKED APPROVED	DATE 04/01/2022	DESIGNED RLT CHECKED DAC APPROVED DAC	PROJECT RENOVATE ARMORY WASHTEAW ARMORY

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

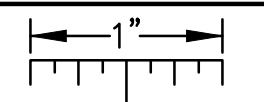
816 E 4th St. 48067
248.842.7666/www.pba.com
FORBES
ARCHITECTURAL ADMINISTRATION

9:\2021\2021-0363-00\CAD\2021-0363-MD5-EP.dwg, MD-501, 3/25/2022 2:14:27 PM, Devin J. Senetich, Peter Basso Associates Inc.



ENLARGED UNDERGROUND RESTROOMS, SHOWERS, AND LOCKER ROOMS - DEMO
SCALE: 1/4" = 1' - 0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

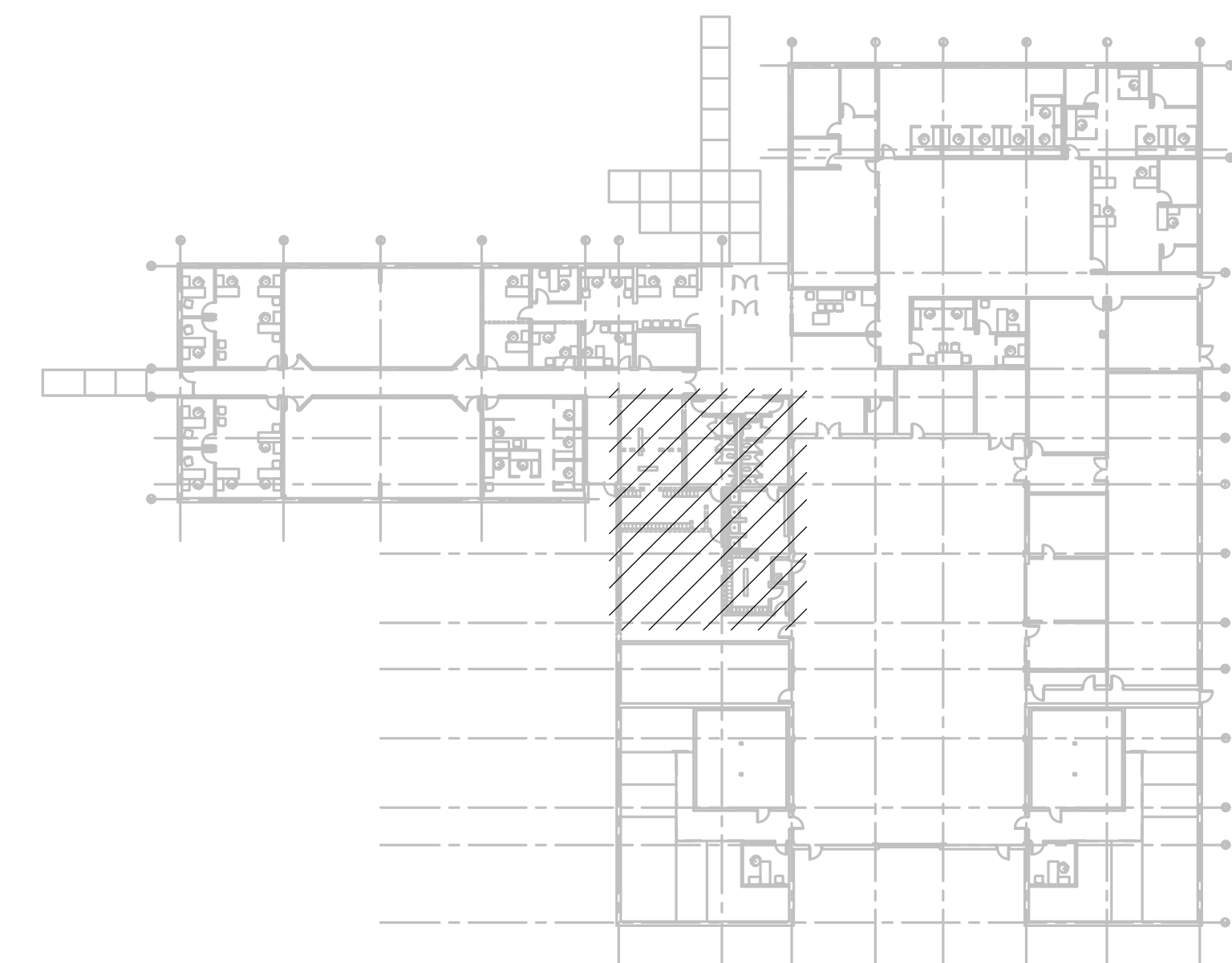


MECHANICAL DEMOLITION GENERAL NOTES:

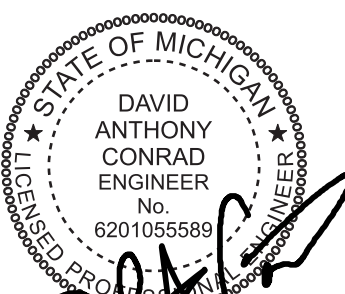
1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
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DEMOLITION KEY NOTES:


- A. REMOVE EXISTING 3" SANITARY BACK TO MAIN AND CAP. REMOVE EXISTING 2" VENT COMPLETE BACK TO NEAREST BRANCH.
- B. REMOVE EXISTING 3" SANITARY COMPLETE. PREPARE FOR RECONNECTION OF NEW 4" SANITARY. SEE SHEET M-501 FOR CONTINUATION OF NEW PIPING.
- C. REMOVE EXISTING FLOOR DRAIN COMPLETE AND PREPARE FOR NEW CONNECTION.
- D. REMOVE EXISTING CW AND TW PIPING BACK TO SOURCE AND CAP. REMOVE EXISTING SHOWER HEADS AND COMPONENTS COMPLETE. PATCH WALL TO MATCH EXISTING.
- E. REMOVE PIPING AS INDICATED AND PREPARE EXISTING PIPING TO REMAIN FOR NEW CONNECTION.
- F. REMOVE EXISTING JANITORS CLOSET SINK AND FAUCET COMPLETE. REMOVE EXISTING COLD WATER PIPING, INSULATION, HANGERS, AND VALVES BACK TO LOCATION INDICATED AND CAP. REMOVE EXISTING HOT WATER CONNECTION BACK TO MAIN. REMOVE EXISTING VENT PIPING BACK TO LOCATION INDICATED AND CAP. REPAIR WALL TO MATCH EXISTING. REMOVE SANITARY TO BELOW FLOOR AND CAP, REPAIR FLOOR TO MATCH EXISTING.
- G. REMOVE CONDENSATE DRAIN TO LOCATION INDICATED. PREPARE EXISTING PIPING FOR NEW CONNECTION, REFER TO NEW WORK PLANS.
- H. REMOVE FIXTURE COMPLETE AND CAP AT MAIN.



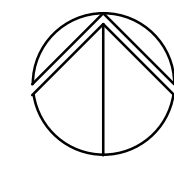
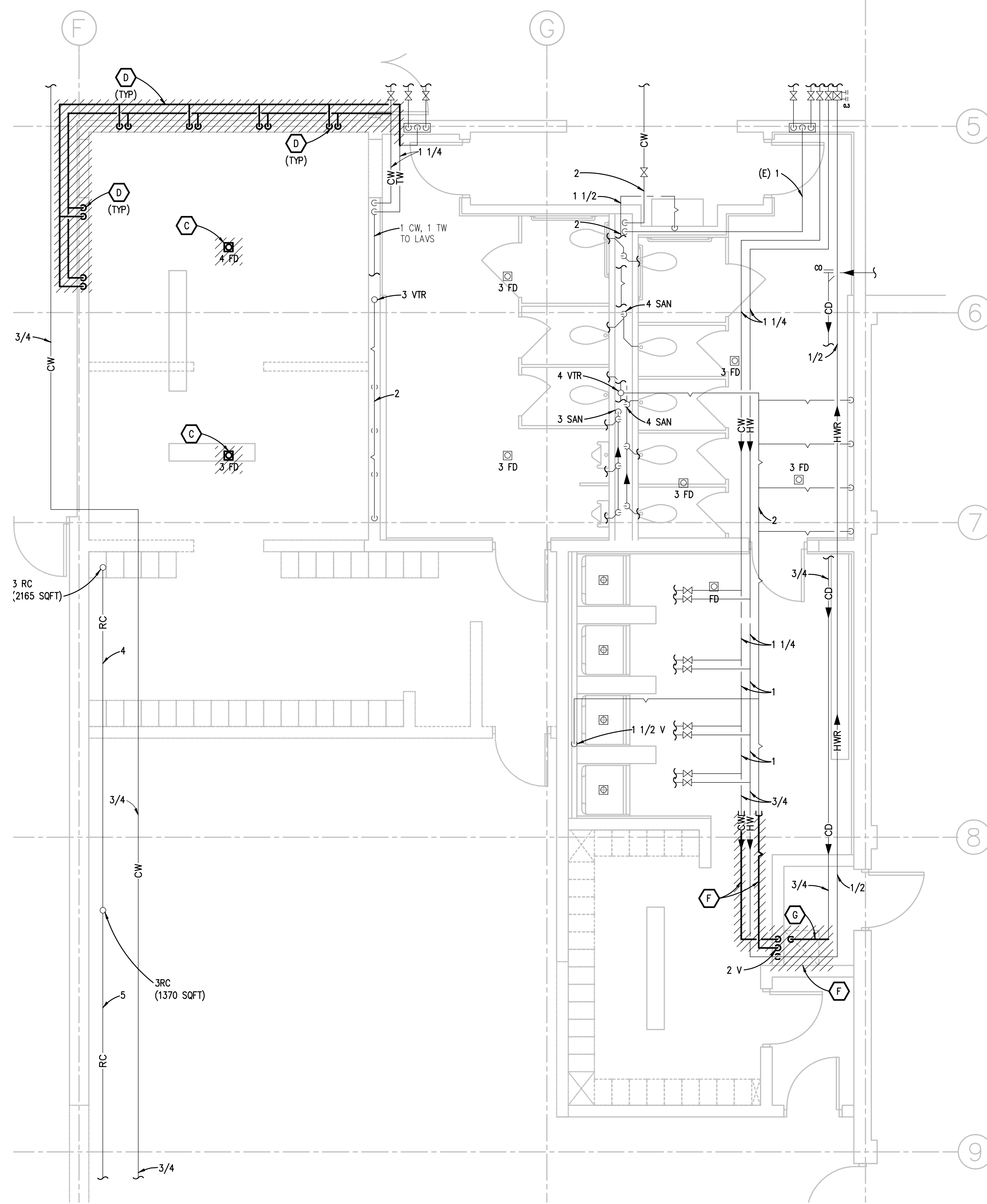
KEY PLAN
NO SCALE



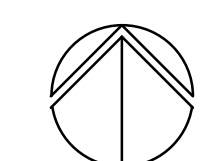
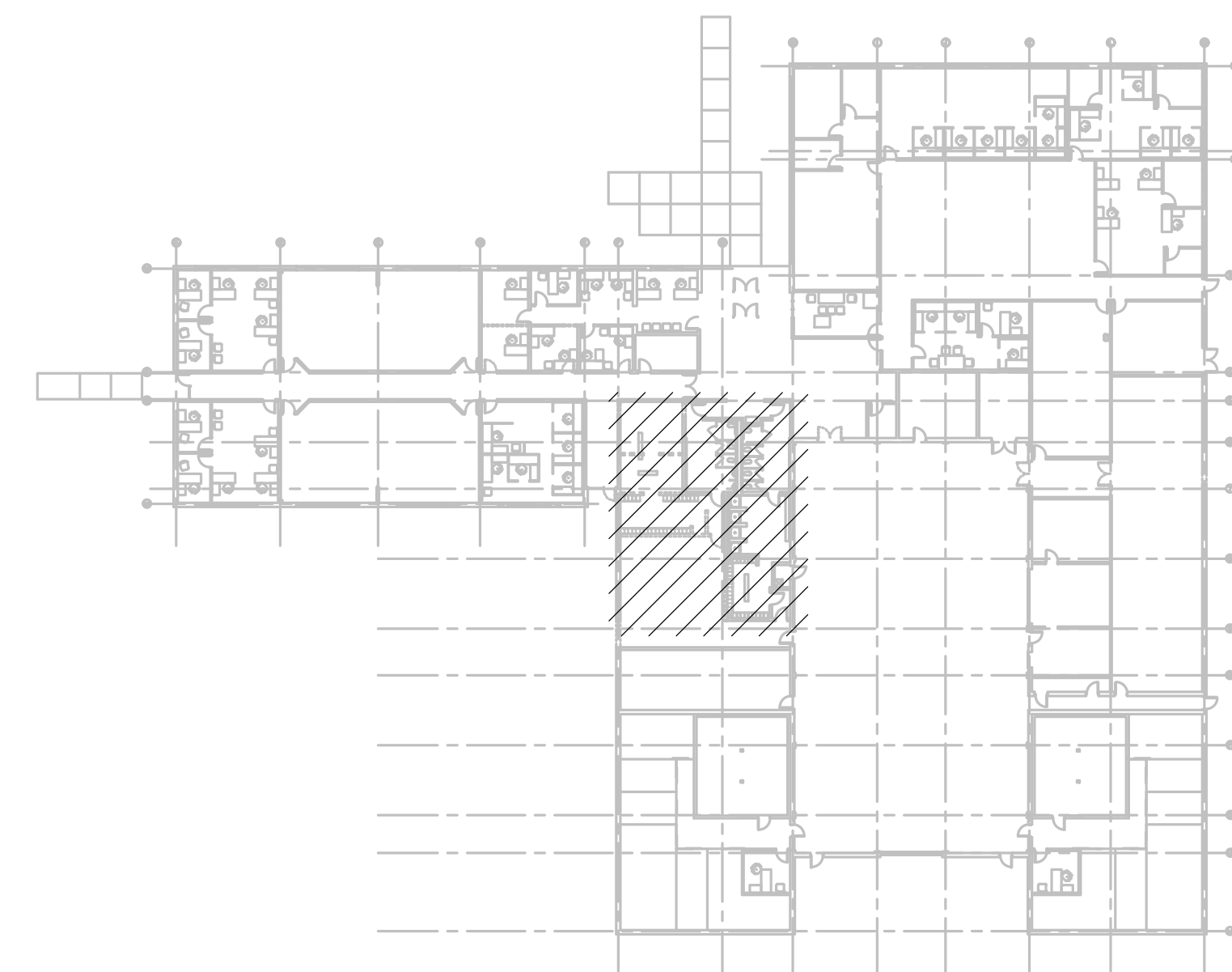
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Tel: 248-878-5556
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www.PeterBassoAssociates.com
FSA Project No. 0021285

DRAWING NUMBER	MD-501
DRAWING TITLE	MECHANICAL ENLARGED DEMOLITION PLANS
SHEET NUMBER	58 OF 96
IDENTIFICATION NUMBER	PROJECT: WASHTEENAW ARMORY CONTRACT NUMBER: 121456 FILE NO. 511/21326.CAK DMA PROJECT NO. 2463802016
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	BPC
DRAWN	RTL
CHECKED	RTL
APPROVED	DAC
PROJECT	RENOVATE ARMORY WASHTEENAW ARMORY
<p>STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR</p>  <p>816 E 4th St. 48067 248-642-7666/www.pbtnc.com</p> <p>FORBES CONSULTING ENGINEERS</p>	

9:\2021\2021-0363-00\CAD\2021-0363-MD5-EP2.dwg, MD-502, 3/25/2022 2:14:34 PM, Devin J. Senechal, Peter Basso Associates Inc.



ENLARGED RESTROOMS, SHOWERS, AND LOCKER ROOMS - DEMO
SCALE: 1/4" = 1' - 0"



KEY PLAN
NO SCALE

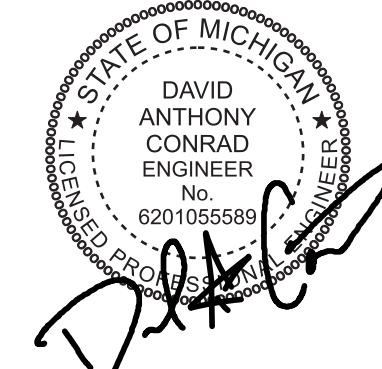
**MECHANICAL DEMOLITION
GENERAL NOTES:**

1. ANY INTERRUPTION OF EXISTING SERVICES AND/OR EQUIPMENT SHALL BE PERFORMED AT A TIME APPROVED IN ADVANCE BY THE OWNER'S REPRESENTATIVE.
2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. ACTUAL ROUTING AND SIZES OF EXISTING PIPING AND DUCTWORK MIGHT DIFFER TO A LIMITED EXTENT FROM WHAT IS SHOWN. MAJOR DISCREPANCIES BETWEEN THE DRAWINGS AND ACTUAL EXISTING CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
3. THE EXACT EXTENT OF DEMOLITION SHALL BE AS REQUIRED BY THE NEW WORK.
4. ALL MECHANICAL ITEMS TO BE REMOVED SHALL BE REMOVED COMPLETE, INCLUDING ALL RELATED ITEMS SUCH AS HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN ENDED PIPES AND DUCTWORK.

DEMOLITION KEY NOTES:

- A. REMOVE EXISTING 3" SANITARY BACK TO MAIN AND CAP. REMOVE EXISTING 2" VENT COMPLETE BACK TO NEAREST BRANCH.
- B. REMOVE EXISTING 3" SANITARY COMPLETE. PREPARE FOR RECONNECTION OF NEW 4" SANITARY. SEE SHEET M-501 FOR CONTINUATION OF NEW PIPING.
- C. REMOVE EXISTING FLOOR DRAIN COMPLETE AND PREPARE FOR NEW CONNECTION.
- D. REMOVE EXISTING CW AND TW PIPING BACK TO SOURCE AND CAP. REMOVE EXISTING SHOWER HEADS AND COMPONENTS COMPLETE. PATCH WALL TO MATCH EXISTING.
- E. REMOVE PIPING AS INDICATED AND PREPARE EXISTING PIPING TO REMAIN FOR NEW CONNECTION.
- F. REMOVE EXISTING JANITORS CLOSET SINK AND FAUCET COMPLETE. REMOVE EXISTING COLD WATER PIPING, INSULATION, HANGERS, AND VALVES BACK TO LOCATION INDICATED AND CAP. REMOVE EXISTING HOT WATER CONNECTION BACK TO MAIN. REMOVE EXISTING VENT PIPING BACK TO LOCATION INDICATED AND CAP. REPAIR WALL TO MATCH EXISTING. REMOVE SANITARY TO BELOW FLOOR AND CAP, REPAIR FLOOR TO MATCH EXISTING.
- G. REMOVE CONDENSATE DRAIN TO LOCATION INDICATED. PREPARE EXISTING PIPING FOR NEW CONNECTION, REFER TO NEW WORK PLANS.
- H. REMOVE FIXTURE COMPLETE AND CAP AT MAIN.

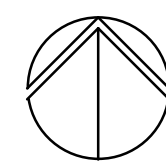
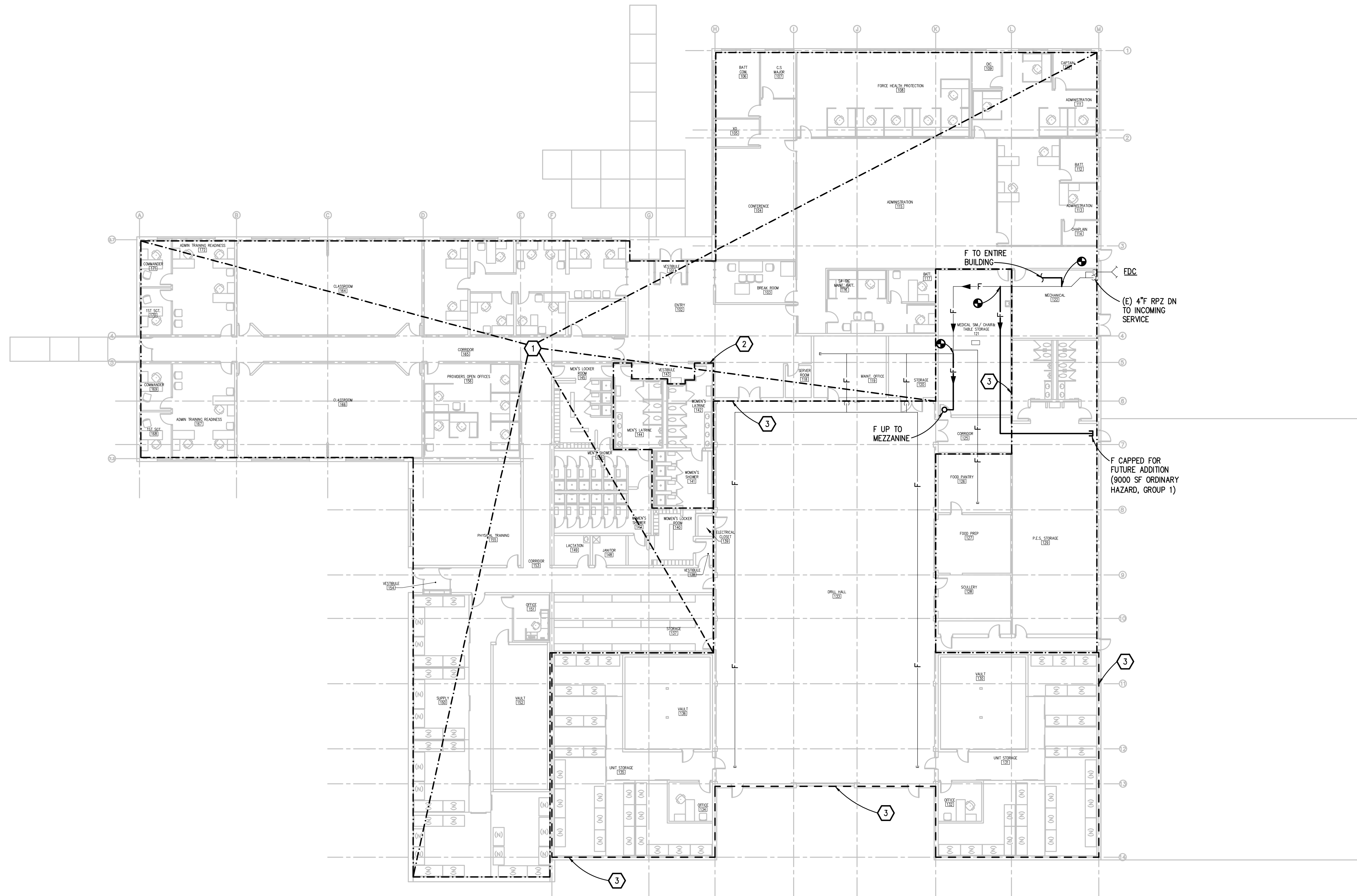
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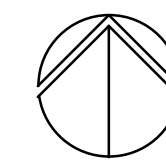
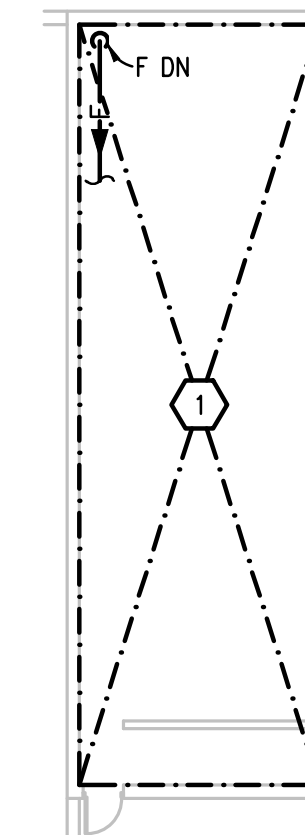
Peter Basso Associates Inc.
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FSA Project No. 002205

STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR	816 E 4th St. 48067 248-842-7666/www.pba.com	FORBES INTERNAL ADMINISTRATION	PROJECT RENOVATE ARMORY ARMORY	DESIGNED BPC	DATE 04/01/2022	ISSUED FOR CONSTRUCTION DOCUMENTS	IDENTIFICATION NUMBER PROJECT: WASHTEENAW ARMORY CONTRACT NUMBER: 127456 FILE NO. 511/21326.CAK DMA PROJECT NO. 2638022016	SHEET NUMBER 59 OF 96	DRAWING TITLE MECHANICAL ENLARGED DEMOLITION PLANS	DRAWING NUMBER MD-502
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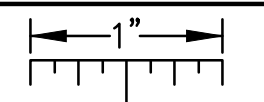


FIRST FLOOR FIRE PROTECTION PLAN
SCALE: 1/16" = 1' - 0"



MEZZANINE FIRE PROTECTION PLAN - PHASE 1
SCALE: 1/16" = 1' - 0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



FIRE PROTECTION GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. NO SPRINKLER PIPING SHALL BE ROUTED THROUGH ELECTRICAL EQUIPMENT ROOMS, TELECOMMUNICATION EQUIPMENT ROOMS, ELEVATOR EQUIPMENT ROOMS OR SIMILAR ROOMS. ONLY SPRINKLER PIPING SERVING SPRINKLERS HEADS IN THOSE ROOMS SHALL BE ALLOWED.
4. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
5. MINIMUM RUN-OUT PIPE SIZE TO SPRINKLER HEADS SHALL BE 1".
6. PROVIDE AN AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13.
7. ACCORDING TO THE MOST RECENT FLOW TEST INFORMATION, THE STATIC PRESSURE AVAILABLE AT THE CITY WATER MAIN AT THE STREET IS 100 PSIG. RESIDUAL PRESSURE WITH IS 75 PSIG. CONTRACTOR SHALL MAKE HIS OWN PRESSURE AND FLOW TEST PRIOR TO SYSTEM DESIGN.

CONSTRUCTION KEY NOTES:

1. PROVIDE WET PIPE FIRE SUPPRESSION SYSTEM IN ACCORDANCE WITH NFPA 13.
2. PROVIDE EXTENDED COVERAGE SIDEWALL HEADS IN AREA INDICATED.
3. (E) UPRIGHT SPRINKLERS IN AREA INDICATED TO REMAIN RECONNECT AS REQUIRED.

STATE OF MICHIGAN
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PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

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FORBES
ARCHITECTURAL ADMINISTRATION
248.642.7666/www.pforbes.com

PROJECT
RENOVATE ARMORY WASHTEAW
ARMORY

DESIGNED
DATE
04/01/2022

ISSUED FOR
CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTEAW ARMORY
CONTRACT NUMBER: Y21465
FILE NO. 511/21326.CAK
DMA PROJECT NO. 263802016

SHEET NUMBER
60 OF 96

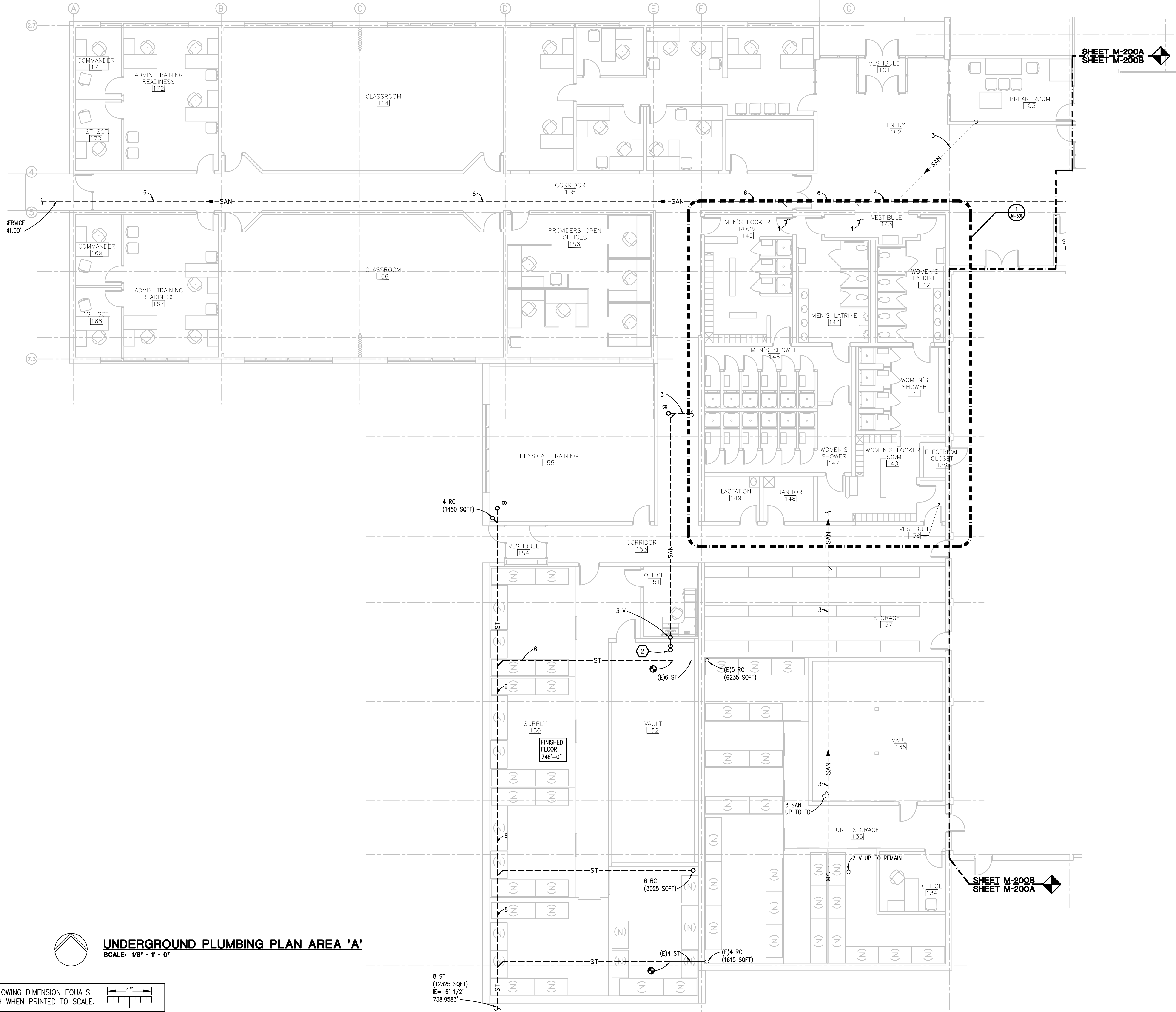
DRAWING TITLE
FIRE PROTECTION PLAN

DRAWING NUMBER
M-101



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FSA-Project No. 0021205

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SHEET M-200A
SHEET M-200B

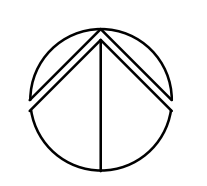
SHEET M-200B
SHEET M-200A

PLUMBING GENERAL NOTES:

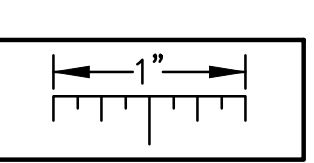
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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

CONSTRUCTION KEY NOTES:

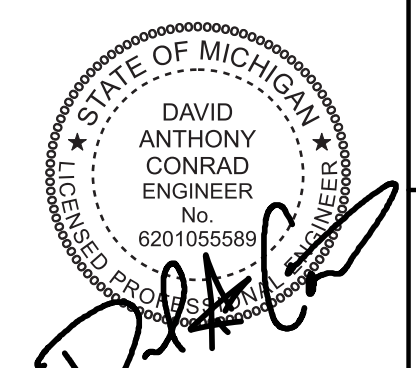
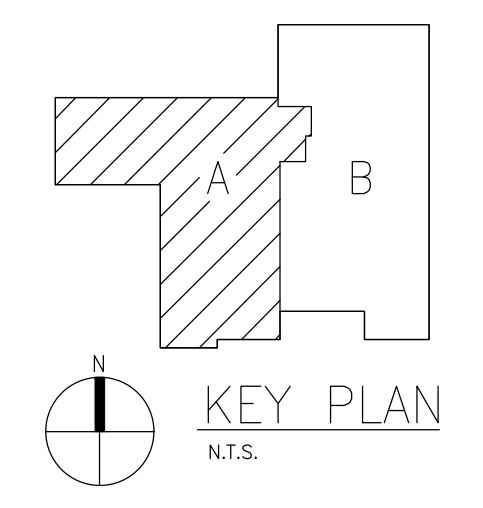
1. 3 SAN TO SHOWER DRAIN.
2. 3 SAN TO FD.
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10. LOCATE ISOLATION VALVES OVER ACCESS PANEL. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
11. TERMINATE CONDENSATE OVER JANITORS CLOSET SINK OR AT CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK



UNDERGROUND PLUMBING PLAN AREA 'A'
SCALE: 1/8" = 1'-0"



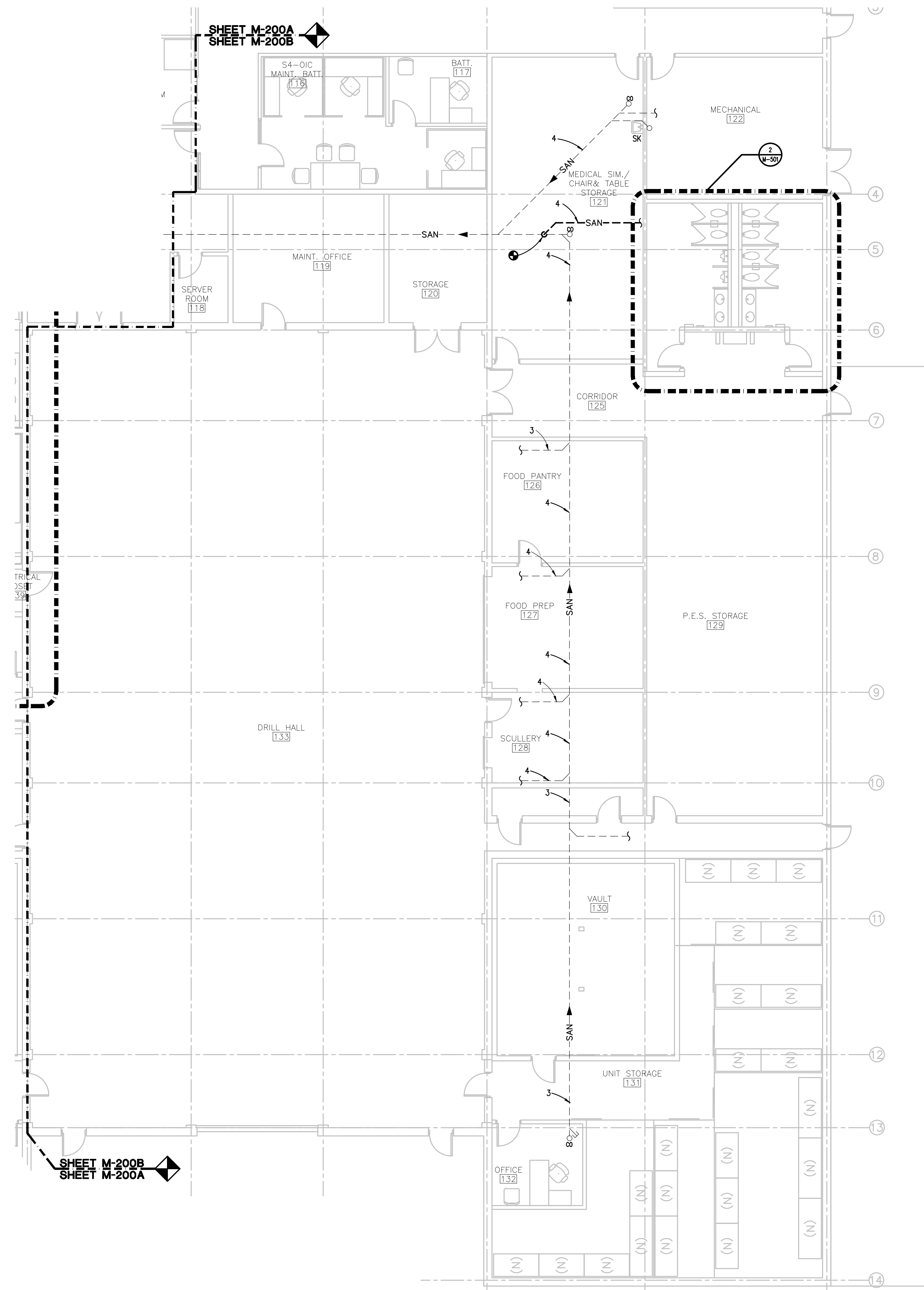
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PBA-Project No. 002-0205

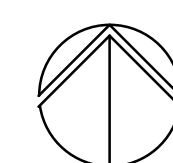
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR	
816 E 4th ST. ANN ARBOR, MI 48107 248.942.7666/www.pba.com	
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
DESIGNED	RLT
DRAWN	CHECKED DAC
DATE	04/01/2022
ISSUED FOR	CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: 121465 FILE NO. 511/21326.0AK
SHEET NUMBER	61 OF 96
DRAWING TITLE	UNDERGROUND PLUMBING PLAN AREA 'A'
DRAWING NUMBER	M-200A

9:\2021\2021-0363-00\CAD\2021-0363-M2-PLD.dwg, M-200B, 3/25/2022 2:14:49 PM, Devin J. Senechal, Peter Bosso Associates Inc.



SHEET M-200A
SHEET M-200B

SHEET M-200B
SHEET M-200A



UNDERGROUND PLUMBING PLAN AREA 'B'
SCALE: 1/8" = 1' - 0"

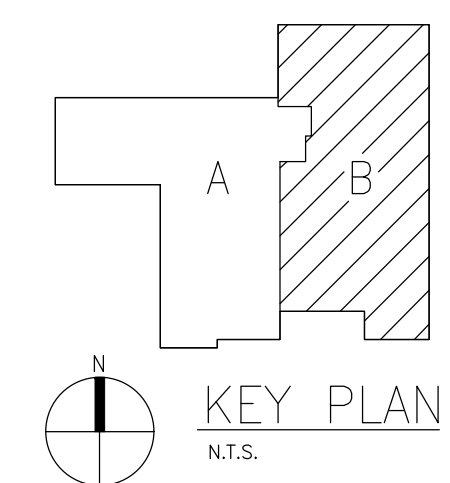
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CONSTRUCTION KEY NOTES:

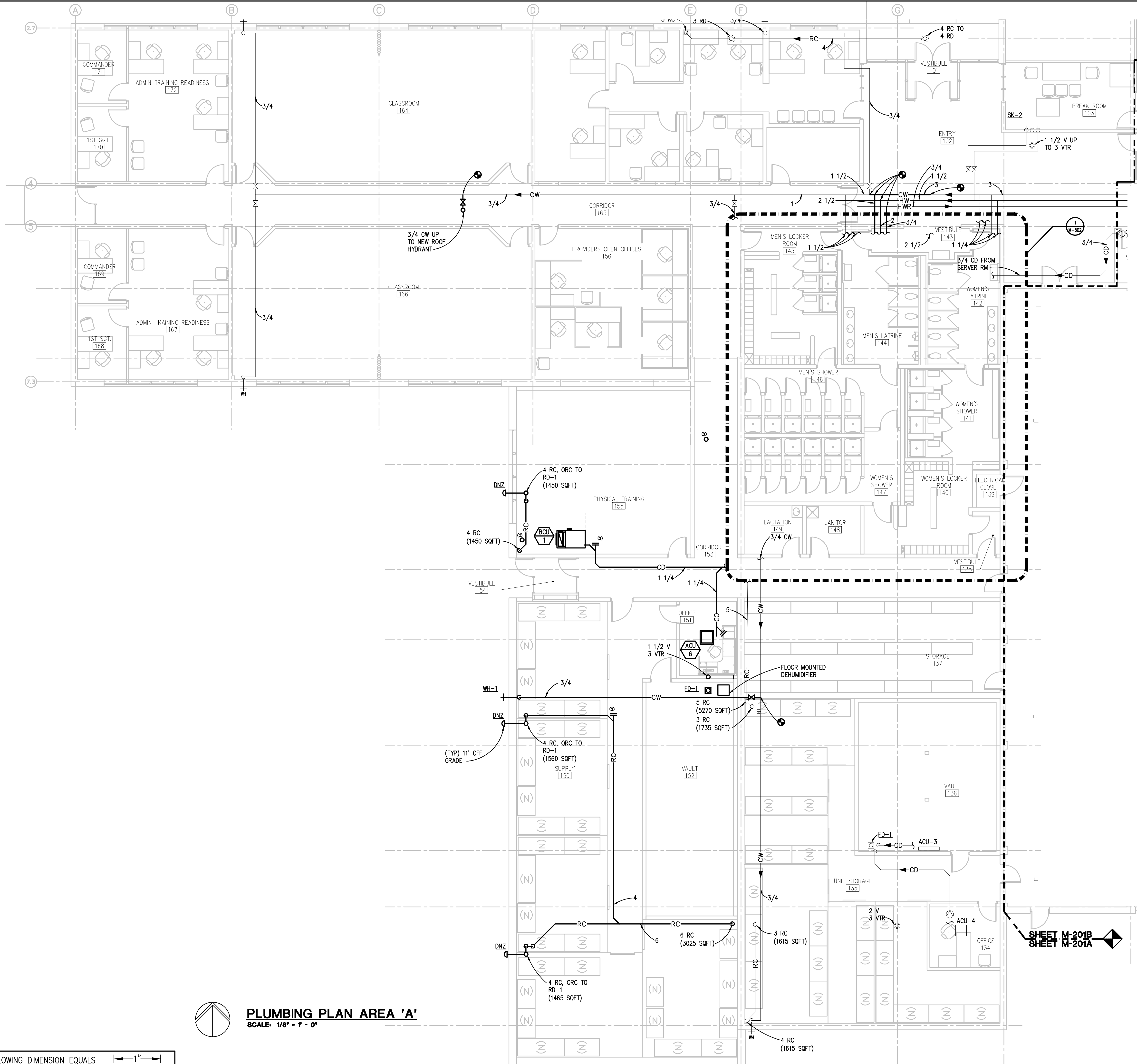
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FSA Project No. 0021205

DRAWING NUMBER	M-200B
	DRAWING TITLE
SHEET NUMBER	62 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	RLT
DRAWN	CHECKED DAC
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
PROJECT IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.CAK DMA PROJECT NO. 263802016
<p>STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR</p>	
<p>816 E 4th St. 48067 248-842-7666/www.pba.com</p> <p>FORBES Financial Administration</p>	

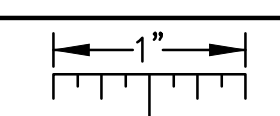
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SHEET M-201A
SHEET M-201B

SHEET M-201B
SHEET M-201A

PLUMBING PLAN AREA 'A'
SCALE: 1/8" = 1'-0"



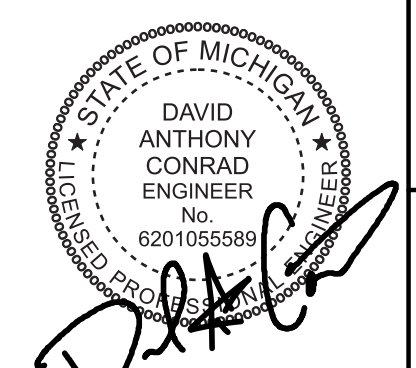
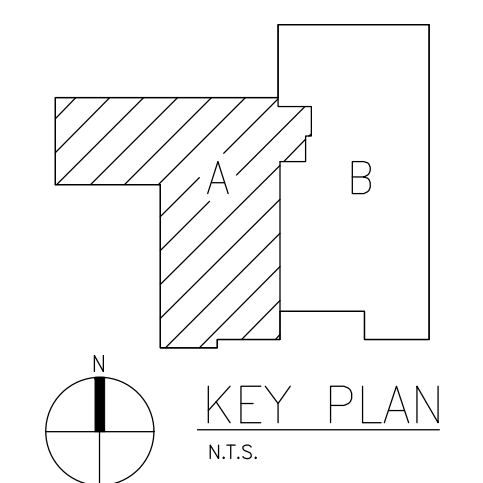
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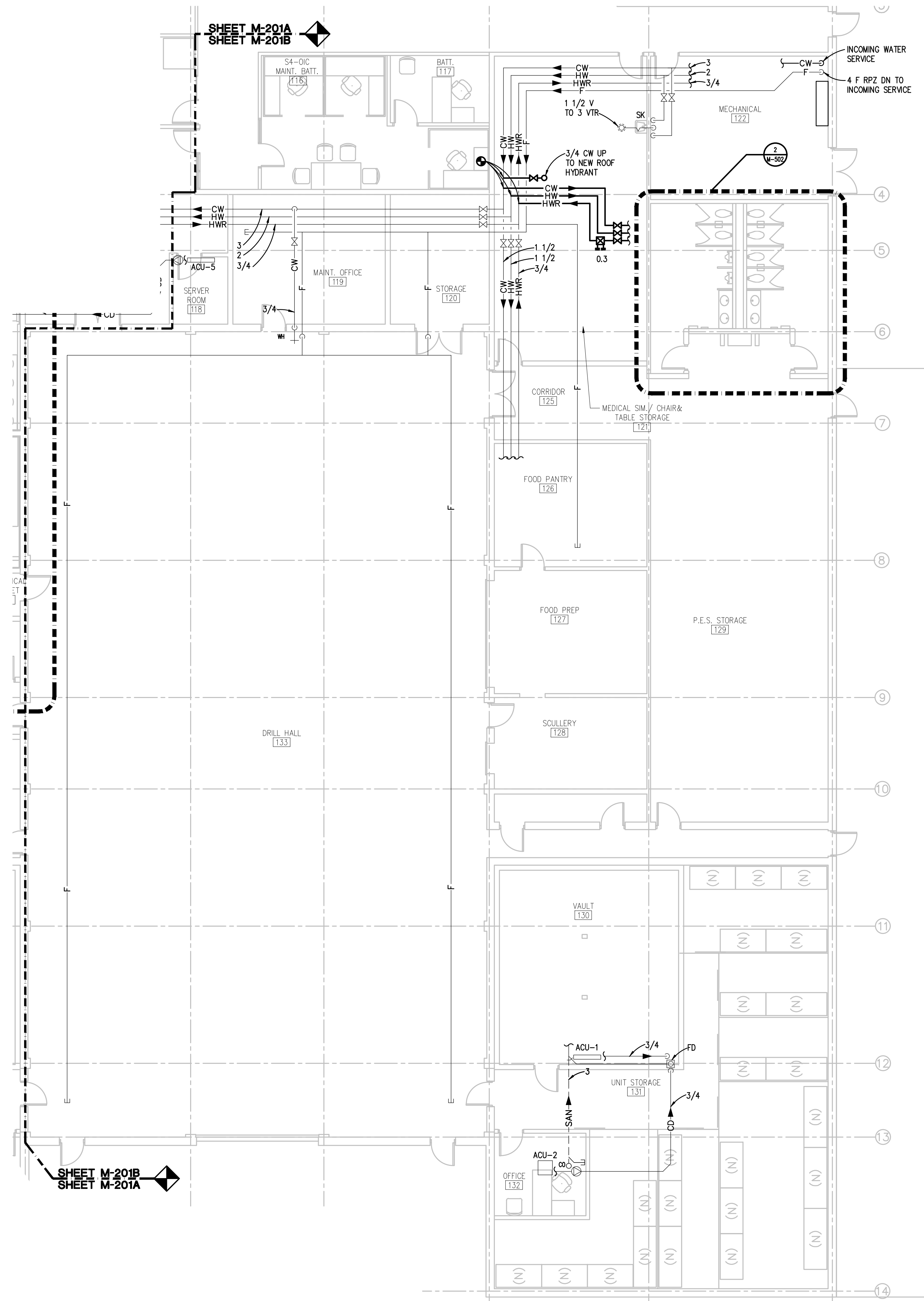
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816 E 4th ST. 48067 248.842.7666/www.pbassoc.com	
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
DESIGNED	RLT
DRAWN	CHECKED DAC
DATE	04/01/2022
ISSUED FOR	CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.CAK DMA PROJECT NO. 2663822016
SHEET NUMBER	63 OF 96
DRAWING TITLE	PLUMBING PLAN AREA 'A'
DRAWING NUMBER	M-201A

9: /2021/2021-0363-00\CAD\2021-0363-M2-PL.dwg, M-201B, 3/25/2022 2:14:58 PM, Devin J. Senechal, Peter Basso Associates Inc.



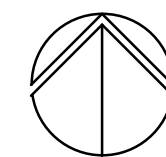
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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

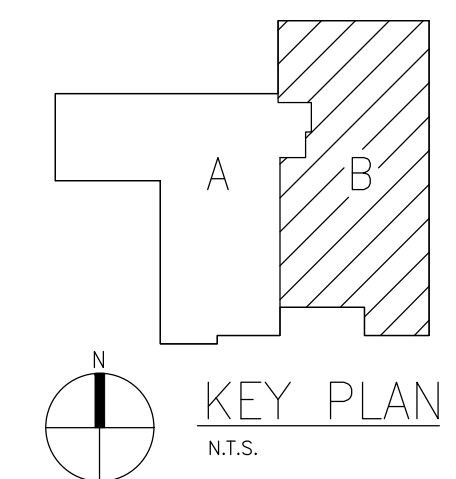
CONSTRUCTION KEY NOTES:

1. 3 SAN TO SHOWER DRAIN.
2. 3 SAN TO FD.
3. NOT USED.
4. 3 SAN TO LAV.
5. 3 SAN TO JC.
6. 4 SAN TO CHASE.
7. 3 SAN TO EWC.
8. CW & HW IN CHASE TO LAVATORIES. ROUTE HWR TO ABOVE CEILING AFTER HW CONNECTION AT LAST LAVATORY. REFER TO LAVATORY PIPING DIAGRAM.
9. 2 1/2 CW IN CHASE, UNDIMINISHED IN SIZE TO POINT OF CONNECTION AT FURTHEST FIXTURE.
10. LOCATE ISOLATION VALVES OVER ACCESS PANEL. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
11. TERMINATE CONDENSATE OVER JANITORS CLOSET SINK OR AT CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



PLUMBING PLAN AREA 'B'
SCALE 1/8" = 1' - 0"

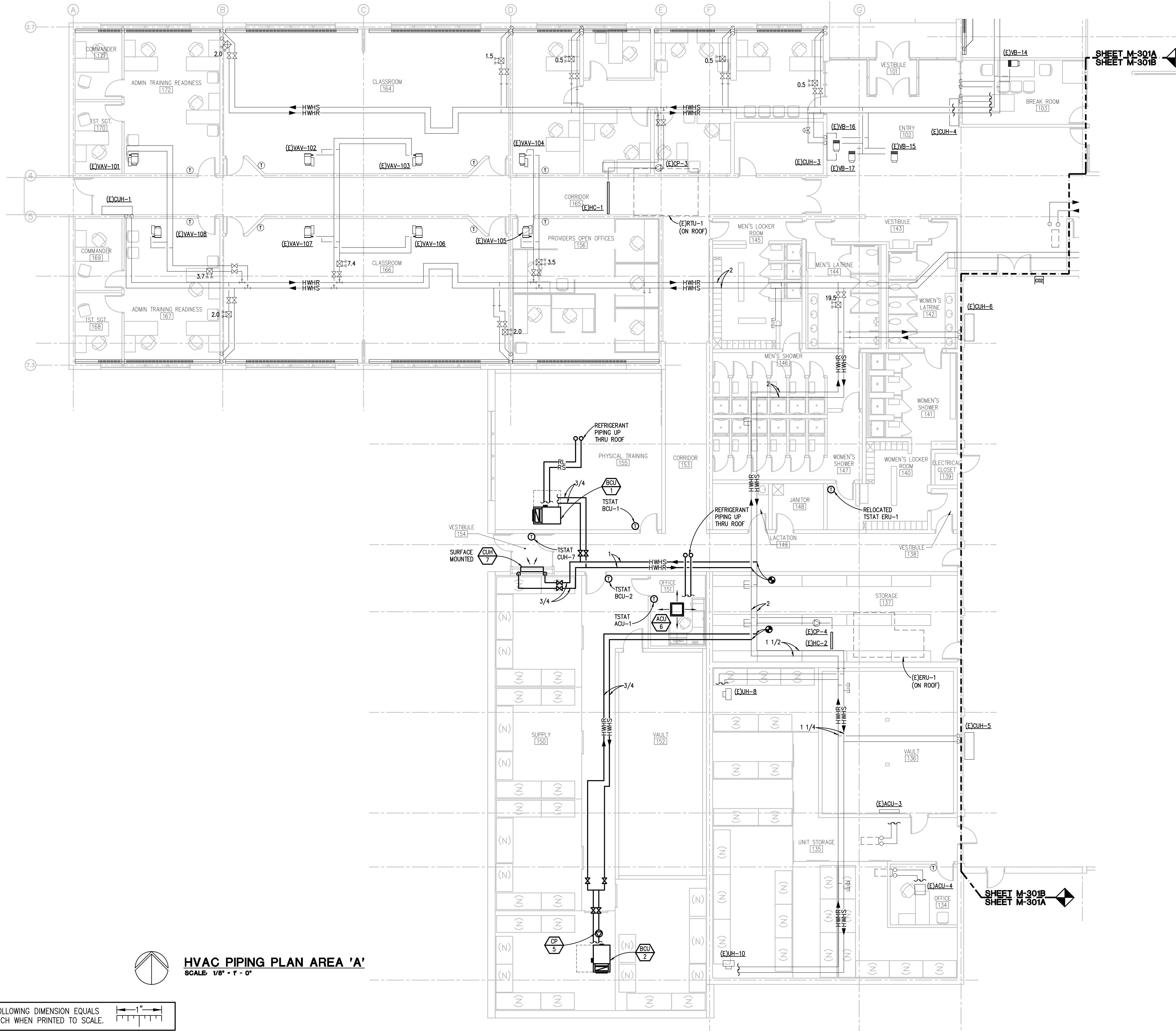


DAVID ANTHONY CONRAD
ENGINEER
No. 6201055589

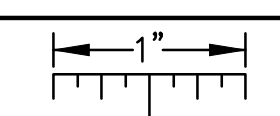
Peter Basso Associates Inc.
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5145 Livernois, Suite 100
Troy, Michigan 48068-3276
Tel: 248-878-5556
Fax: 248-878-0007
www.PeterBassoAssociates.com
FSA Project No. 0021285

DRAWING NUMBER	M-201B
	PLUMBING PLAN AREA 'B'
DRAWING TITLE	PLUMBING PLAN AREA 'B'
SHEET NUMBER	64 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	RLT
DRAWN	CHECKED DAC
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR 816 E 4th ST. 48067 248.842.7666/www.prfac.com [FORBES]	

9: 2021\2021-0363-00\CAD\2021-0363-M3-HP.dwg, M-301A, 3/25/2022 2:15:06 PM, Devin J. Senechal, Peter Basso Associates Inc.



HVAC PIPING PLAN AREA 'A'
SCALE: 1/8" = 1' - 0"



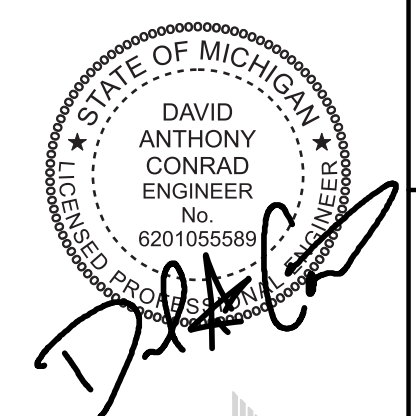
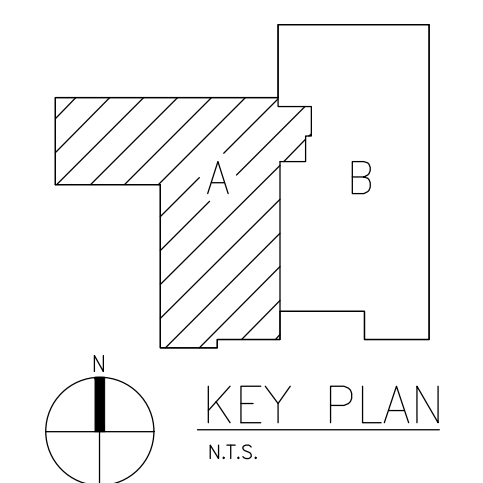
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

HVAC PIPING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. SUBMIT PROPOSED METHODS OF ANCHORING AND GUIDING PIPING SYSTEMS TO STRUCTURAL ENGINEER FOR APPROVAL.
7. COORDINATE LOCATION OF DUCT-MOUNTED HYDRONIC DEVICES WITH SHEET METAL TRADES.
8. BRANCH PIPING SERVING TERMINAL UNIT HEATING COILS OR RADIANT CEILING PANELS SHALL BE 3/4" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING MORE THAN ONE TERMINAL UNIT HEATING COIL SHALL BE 1" UNLESS OTHERWISE NOTED. BRANCH PIPING SERVING HOT WATER UNIT HEATERS AND CABINET UNIT HEATERS SHALL BE 1" UNLESS OTHERWISE NOTED.
9. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

SHEET M-301A
SHEET M-301B

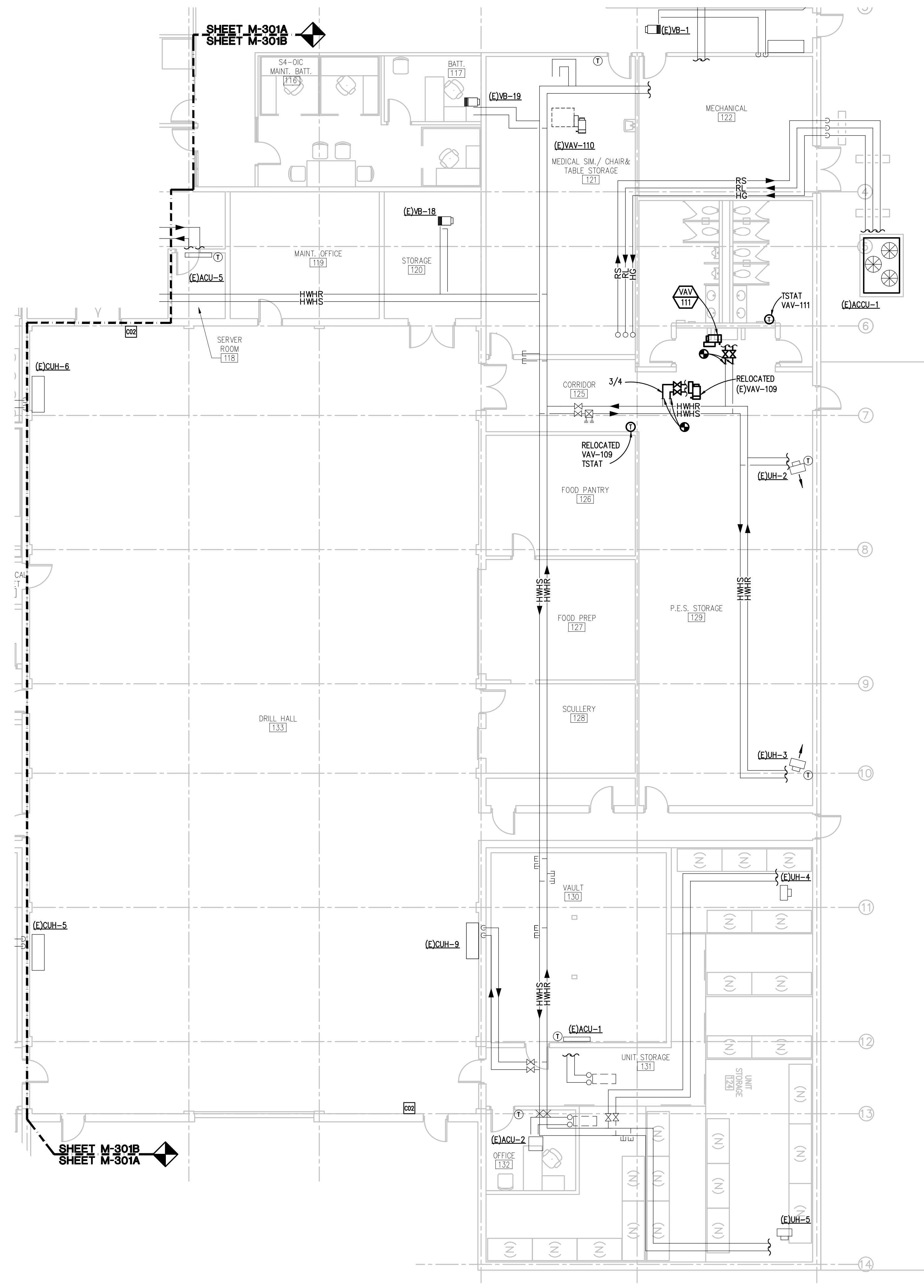
SHEET M-301B
SHEET M-301A



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5145 Livernois, Suite 100
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PBA-Project No. 0021205

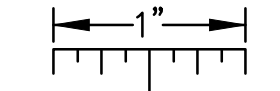
DRAWING NUMBER	M-301A
	HVAC PIPING PLAN AREA 'A'
DRAWING TITLE	HVAC PIPING PLAN AREA 'A'
SHEET NUMBER	65 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	RLT
DRAWN	CHECKED DAC
PROJECT	RENOVATE ARMORY WASHTEENAW ARMORY
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, P.E., DIRECTOR	

9:\2021\2021-0363-00\CAD\2021-0363-M3-HP.dwg, M-301B, 3/25/2022 2:15:07 PM, Devin J. Senechal, Peter Basso Associates Inc.



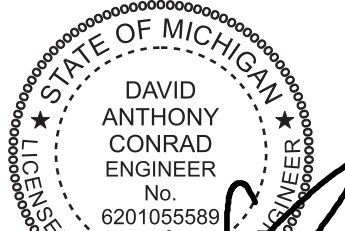
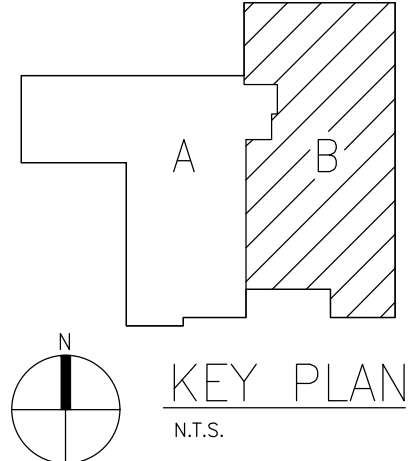
HVAC PIPING PLAN AREA 'B'
SCALE: 1/8" = 1' 0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



HVAC PIPING GENERAL NOTES:

- THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
- INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- PIPING AND DUCTWORK SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
- COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
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- REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.



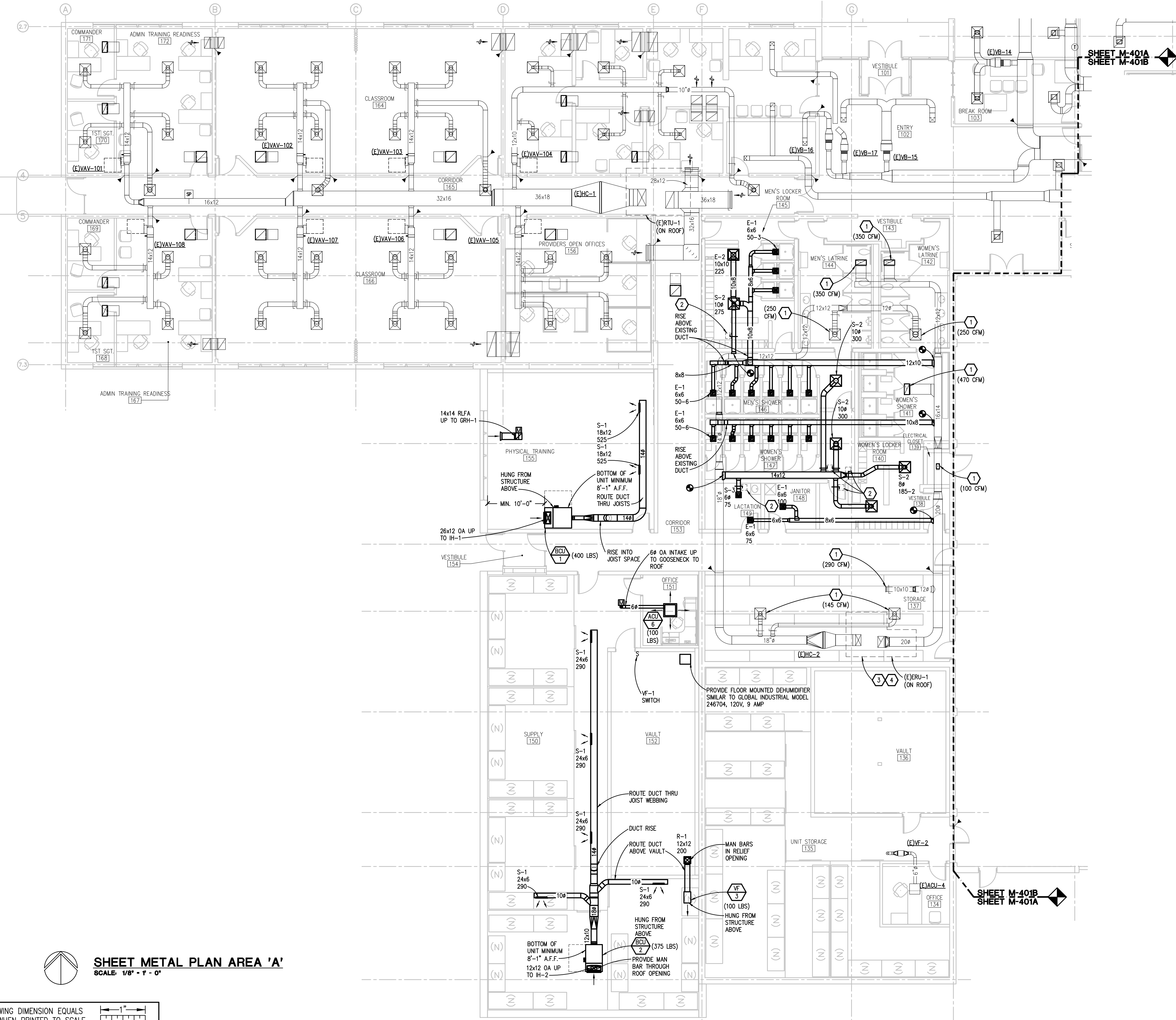
Peter Basso Associates Inc.
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Fax: 248-878-0007
www.PeterBassoAssociates.com
PBA Project No. 20210363

M-301B	DRAWING NUMBER	DRAWING TITLE	SHEET NUMBER	ISSUED FOR	DATE	DESIGNED	PROJECT
	HVAC PIPING PLAN AREA 'B'	66 OF 96	CONSTRUCTION DOCUMENTS	04/01/2022	RLT	RENOVATE ARMORY WASHTEAW ARMORY	
PROJECT: WASHTEAW ARMORY		CONTRACT NUMBER: 121456		FILE NO. 511/21326.0AK		PROJECT NO. 2638022016	

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th St. 48067
248-642-7666/www.pba.com
FORBES
Financial Administration

9: 2021\2021-0363-00\CAD\2021-0363-M4-SM.dwg, M-401A, 3/25/2022 2:15:27 PM, Devin J. Senechal, Peter Basso Associates Inc.



SHEET METAL GENERAL NOTES:

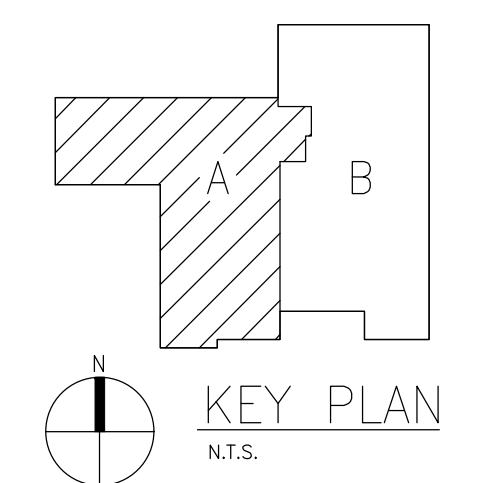
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6. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR DIMENSIONED LOCATION OF GRILLES, REGISTERS, AND DIFFUSERS.
7. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1. REBALANCE EXISTING GRILLE OR DIFFUSER TO AIRFLOW INDICATED.
2. LOCATED DUCTWORK AND DAMPER OVER ACCESS PANEL, REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION.
3. REBALANCE EXISTING ERU-1 SUPPLY FAN TO 2110 CFM AT 0.9" ESP.
4. REBALANCE EXISTING ERU-1 EXHAUST FAN TO 2410 CFM AT 1.0" ESP.

SHEET METAL PLAN AREA 'A'
SCALE: 1/8" = 1'-0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



STATE OF MICHIGAN
DAVID ANTHONY CONRAD
ENGINEER
No. 6201055589

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FSA Project No. 0021036

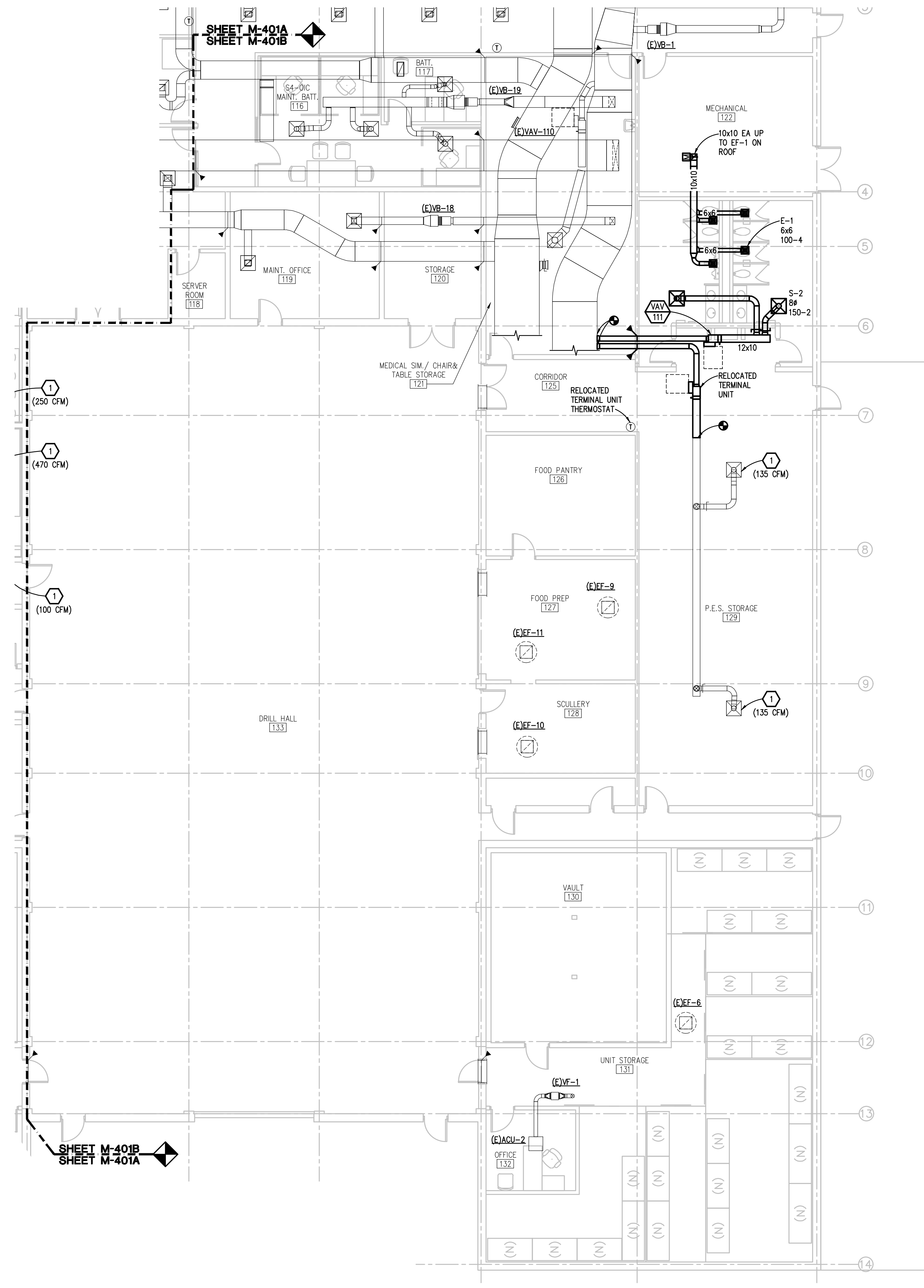
DRAWING NUMBER	M-401A
	SHEET METAL PLAN AREA 'A'
DRAWING TITLE	SHEET METAL PLAN AREA 'A'
SHEET NUMBER	67 OF 95
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	RLT
DRAWN	CHECKED DAC
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
PROJECT	ARMORY WASHTEAW
DESIGNED	RLT
DRAWN	CHECKED DAC
DATE	04/01/2022
ISSUED FOR	CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: 121456 FILE NO. 511/21326.0A
SHEET NUMBER	67 OF 95
DRAWING TITLE	SHEET METAL PLAN AREA 'A'
DRAWING NUMBER	M-401A

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th St. #8087
Troy, MI 48068
248-842-7866 / www.pba.com

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Contract Administrator

9: /2021/2021-0363-00\CAD\2021-0363-M4-SM.dwg, M-401B, 3/25/2022 2:15:29 PM, Devin J. Senechal, Peter Basso Associates Inc.



THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

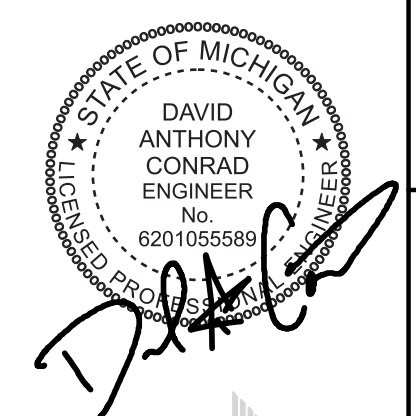
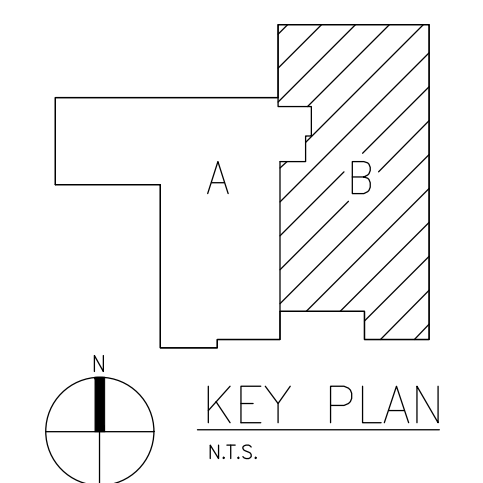
SHEET METAL PLAN AREA 'B'
SCALE: 1/8" = 1'-0"

SHEET METAL GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
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7. REFER TO TEMPERATURE CONTROLS STANDARD MOUNTING HEIGHTS DETAIL FOR ELEVATIONS OF WALL MOUNTED TEMPERATURE CONTROL DEVICES.

CONSTRUCTION KEY NOTES:

1. REBALANCE EXISTING GRILLE OR DIFFUSER TO AIRFLOW INDICATED.
2. LOCATED DUCTWORK AND DAMPER OVER ACCESS PANEL, REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION.
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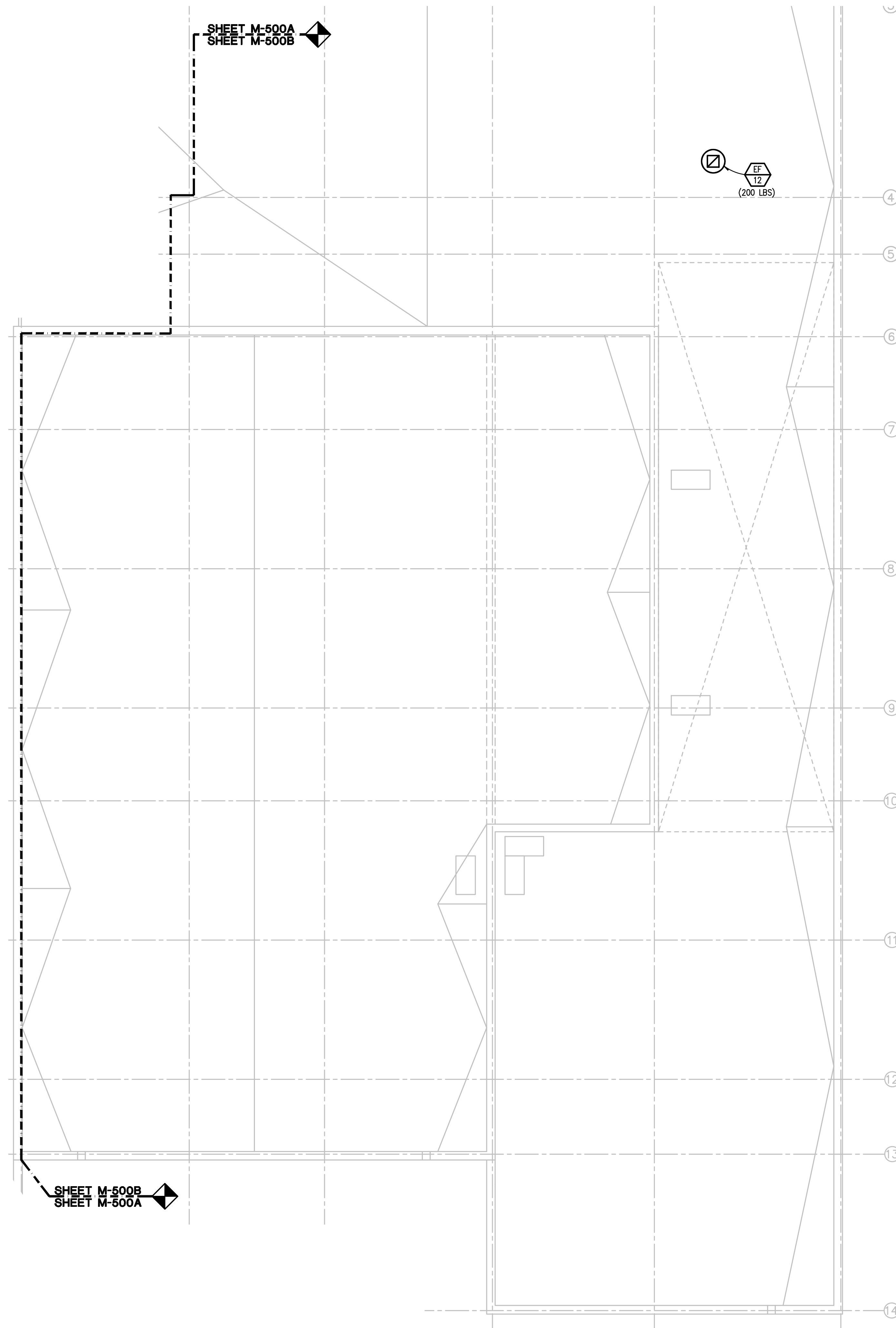


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Fax: 248-878-0007
www.PeterBassoAssociates.com
FSA Project No. 0021205

DRAWING NUMBER M-401B	DRAWING TITLE SHEET METAL PLAN AREA 'B'	SHEET NUMBER 68 OF 96	ISSUED FOR CONSTRUCTION DOCUMENTS	DATE 04/01/2022	DESIGNED RLT	PROJECT RENOVATE ARMORY WASHTEAW ARMORY
	IDENTIFICATION NUMBER PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.GAK DMA PROJECT NO. 2638022016		CHECKED DAC	APPROVED DAC	FORBES 816 E 4th St. 48067 248.842.7666/www.pba.com	

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

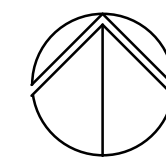
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SHEET M-500A
SHEET M-500B

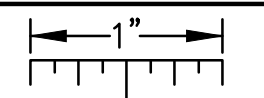
EF
12
(200 LBS)

SHEET M-500B
SHEET M-500A



MECHANICAL ROOF PLAN AREA 'B'
SCALE: 1/8" = 1' - 0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

SHEET METAL GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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STATE OF MICHIGAN
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ANN ARBOR MI 48107
248.642.7666/www.pforbes.com
[FORBES]
ARCHITECTURAL ADMINISTRATION

PROJECT
RENOVATE ARMORY WASHTEAW
ARMORY

DESIGNED
DRAWN BPC
CHECKED RLT
APPROVED DAC

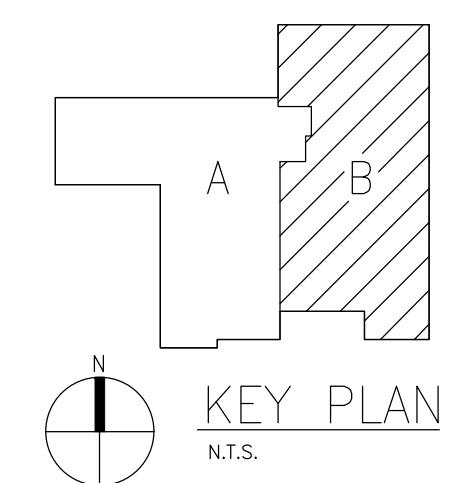
DATE
04/01/2022

ISSUED FOR
CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER
PROJECT: WASHTEAW ARMORY
CONTRACT NUMBER: Y2146
FILE NO. 511/21326.CAK
DMA PROJECT NO. 263802016

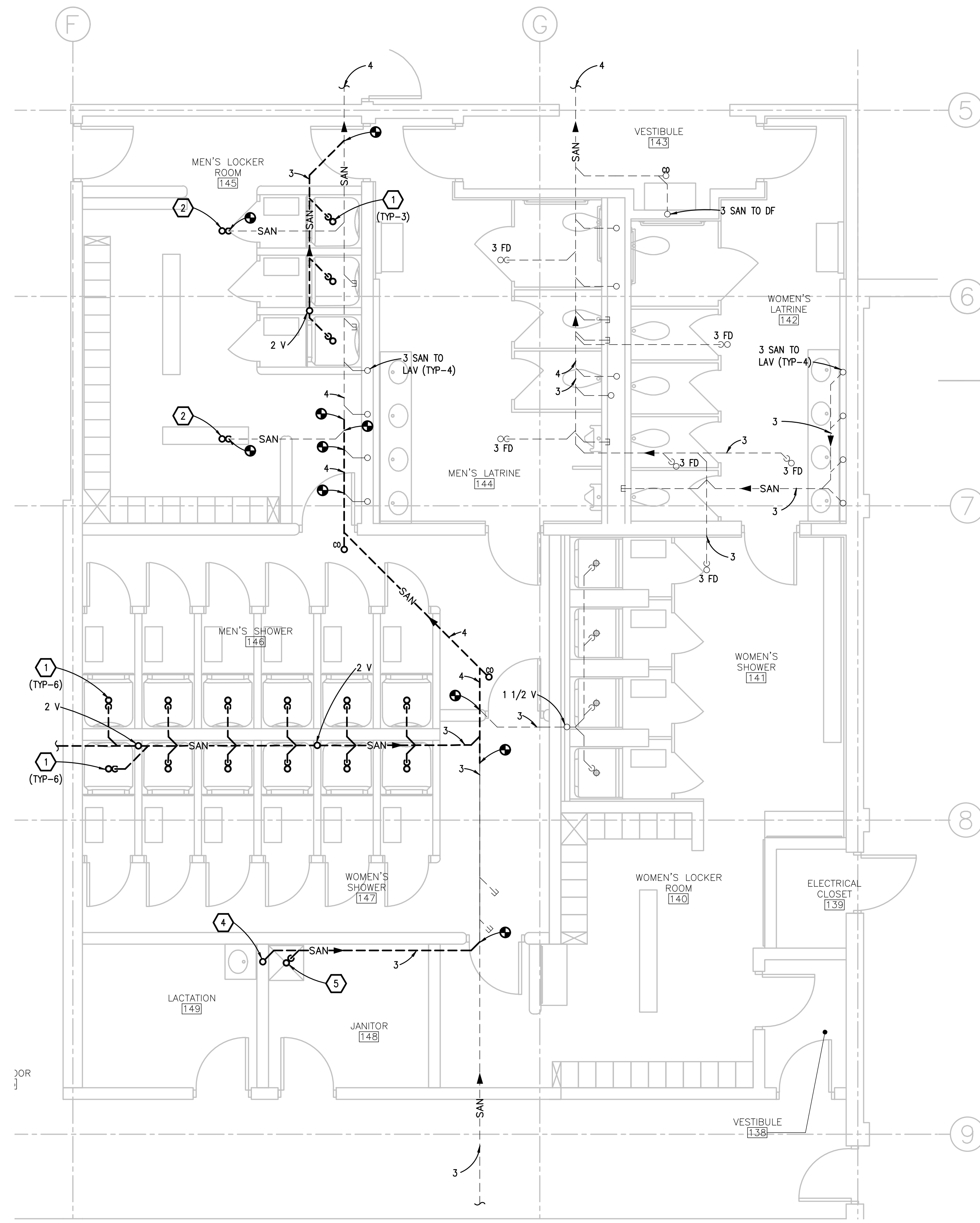
SHEET NUMBER
70 OF 96

DRAWING TITLE
MECHANICAL ROOF PLAN AREA 'B'
M-500B

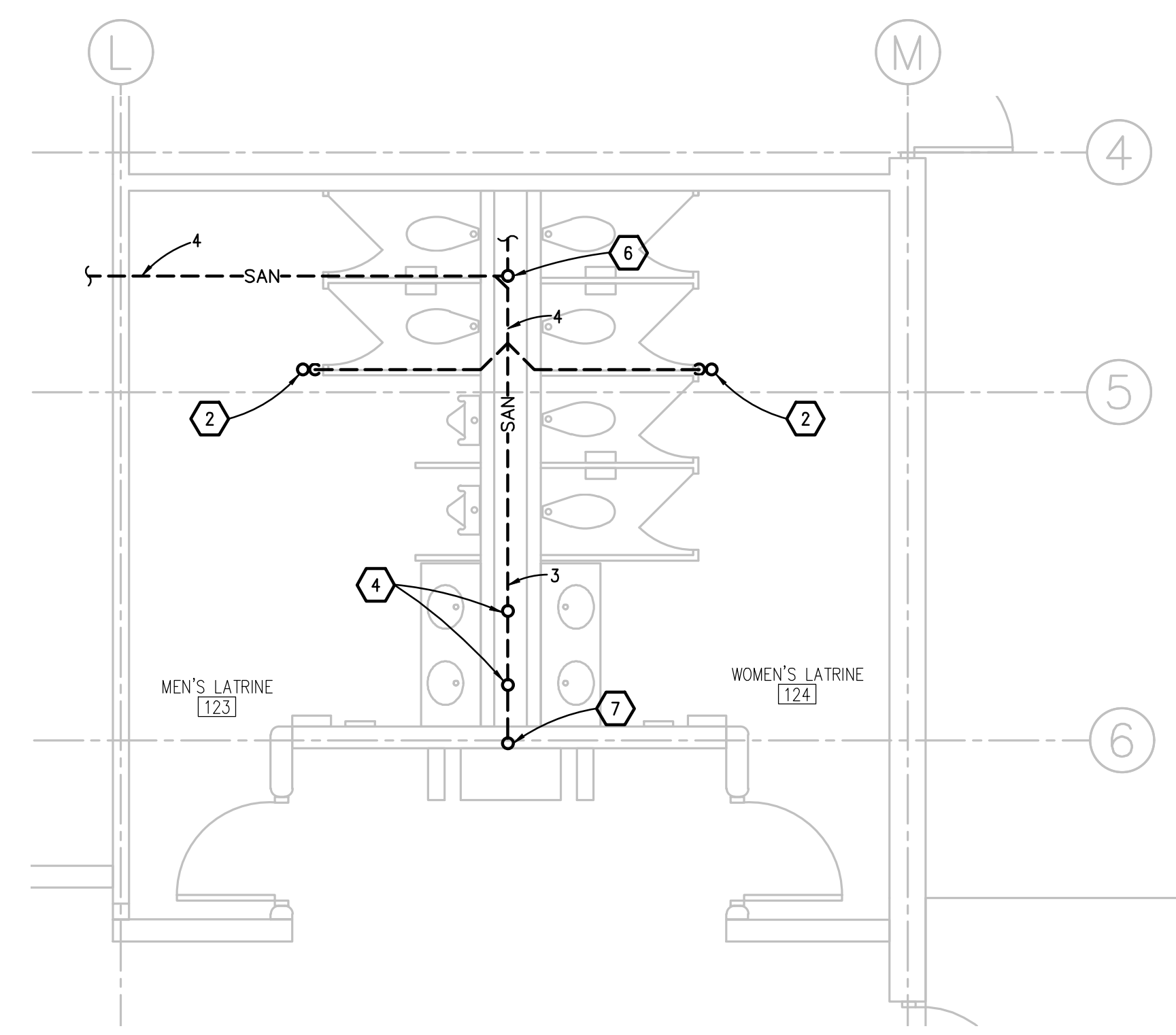


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Tel: 248-878-5556
Fax: 248-878-0007
www.PeterBassoAssociates.com
PBA Project No. 0021205

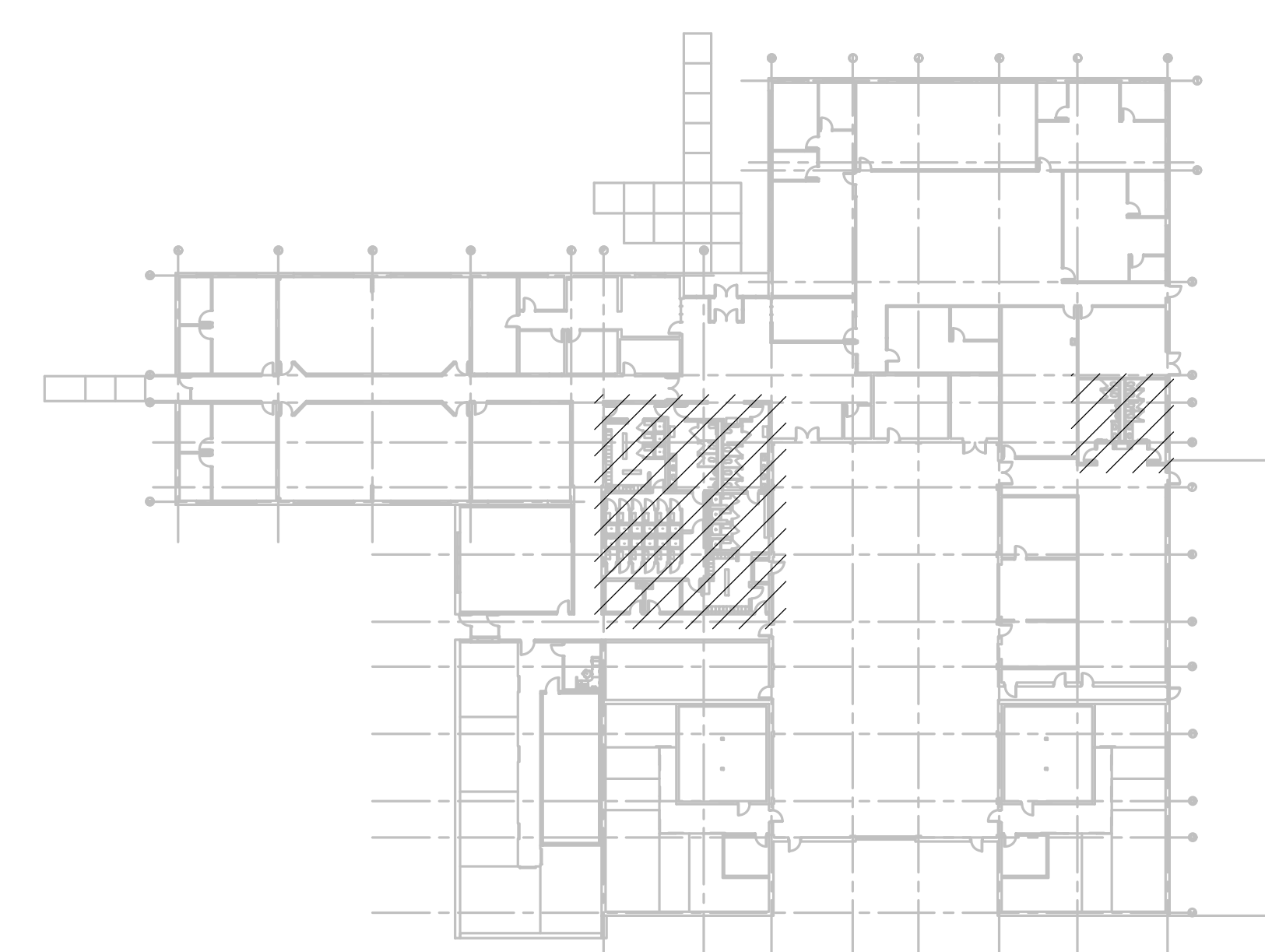
9:\2021\2021-0363-00\CAD\2021-0363-MS-EP.dwg, M-501, 3/25/2022 2:15:43 PM, Devin J. Senecal, Peter Bosso Associates Inc.



ENLARGED UNDERGROUND RESTROOMS, SHOWERS, AND LOCKER ROOMS
SCALE: 1/4" = 1' - 0"



ENLARGED UNDERGROUND RESTROOMS
SCALE: 1/4" = 1' - 0"



KEY PLAN
NO SCALE

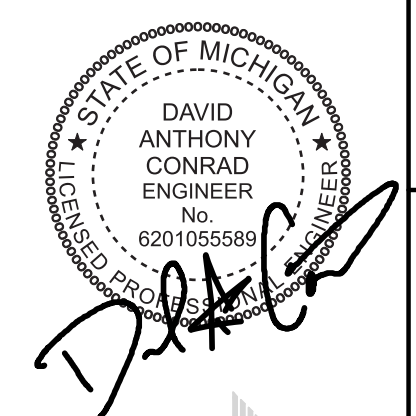
PLUMBING GENERAL NOTES:

1. THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
2. INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
3. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS OR MOTOR CONTROL CENTERS.
4. COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
5. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONED LOCATIONS OF PLUMBING FIXTURES.
7. HOT AND COLD WATER PIPING RUN-OUTS TO LAVATORIES AND SINKS SHALL BE 1/2" UNLESS OTHERWISE NOTED.
8. PLUMBING VENT PIPING THROUGH ROOF SHALL BE LOCATED A MINIMUM OF 10'-0" FROM ANY FRESH AIR INTAKE LOCATION AND A MINIMUM OF 18" CLEAR FROM THE INSIDE FACE OF PARAPET.
9. PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
10. MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

CONSTRUCTION KEY NOTES:

1. 3 SAN TO SHOWER DRAIN.
2. 3 SAN TO FD.
3. NOT USED.
4. 3 SAN TO LAV.
5. 3 SAN TO JC.
6. 4 SAN TO CHASE.
7. 3 SAN TO EWC.
8. CW & HW IN CHASE TO LAVATORIES. ROUTE HWR TO ABOVE CEILING AFTER HW CONNECTION AT LAST LAVATORY. REFER TO LAVATORY PIPING DIAGRAM.
9. 2 1/2 CW IN CHASE, UNDIMINISHED IN SIZE TO POINT OF CONNECTION AT FURTHEST REFLECTED CEILING PLAN.
10. LOCATE ISOLATION VALVES OVER ACCESS PANEL. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
11. TERMINATE CONDENSATE OVER JANITORS CLOSET SINK OR AT CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK

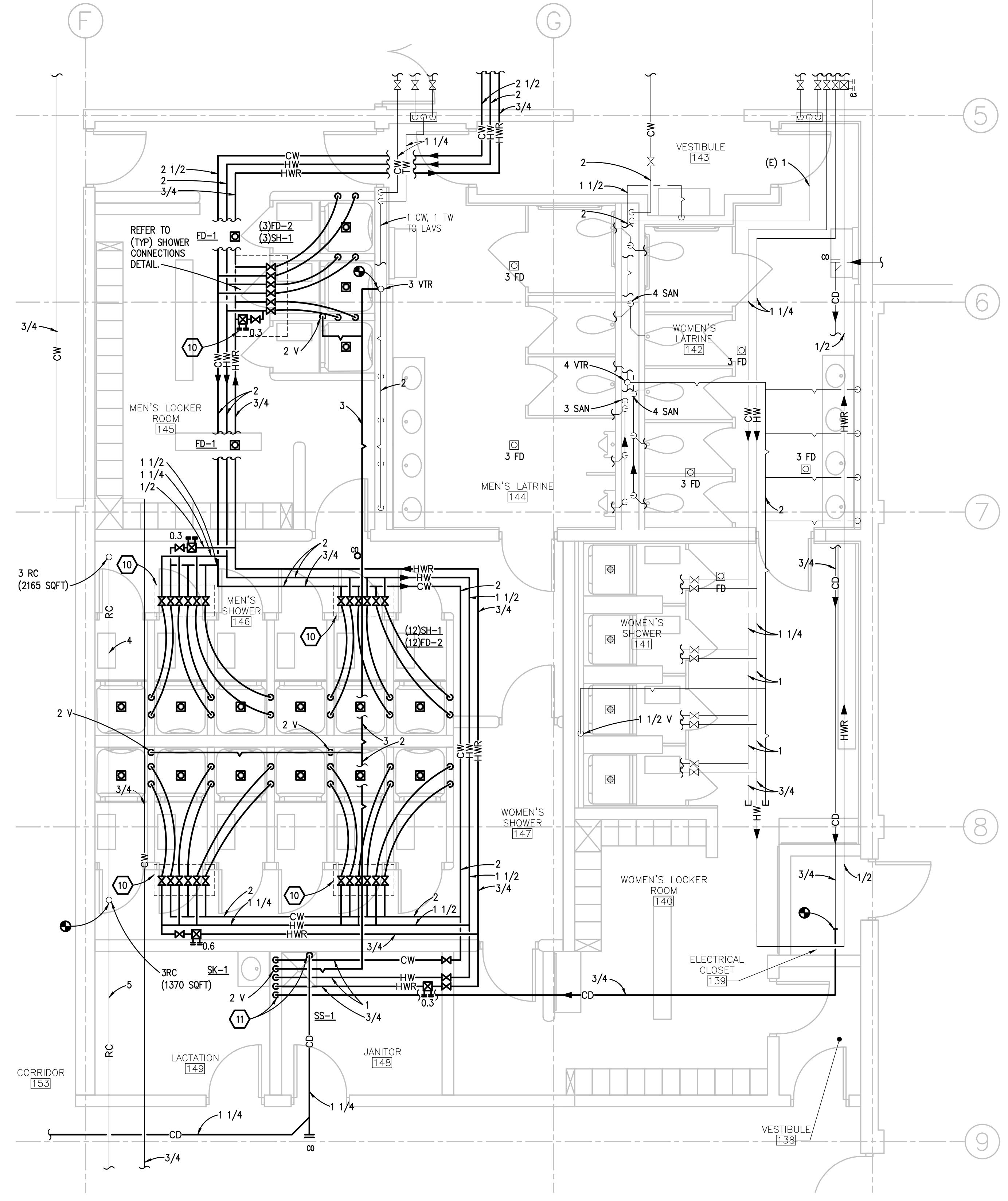
THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



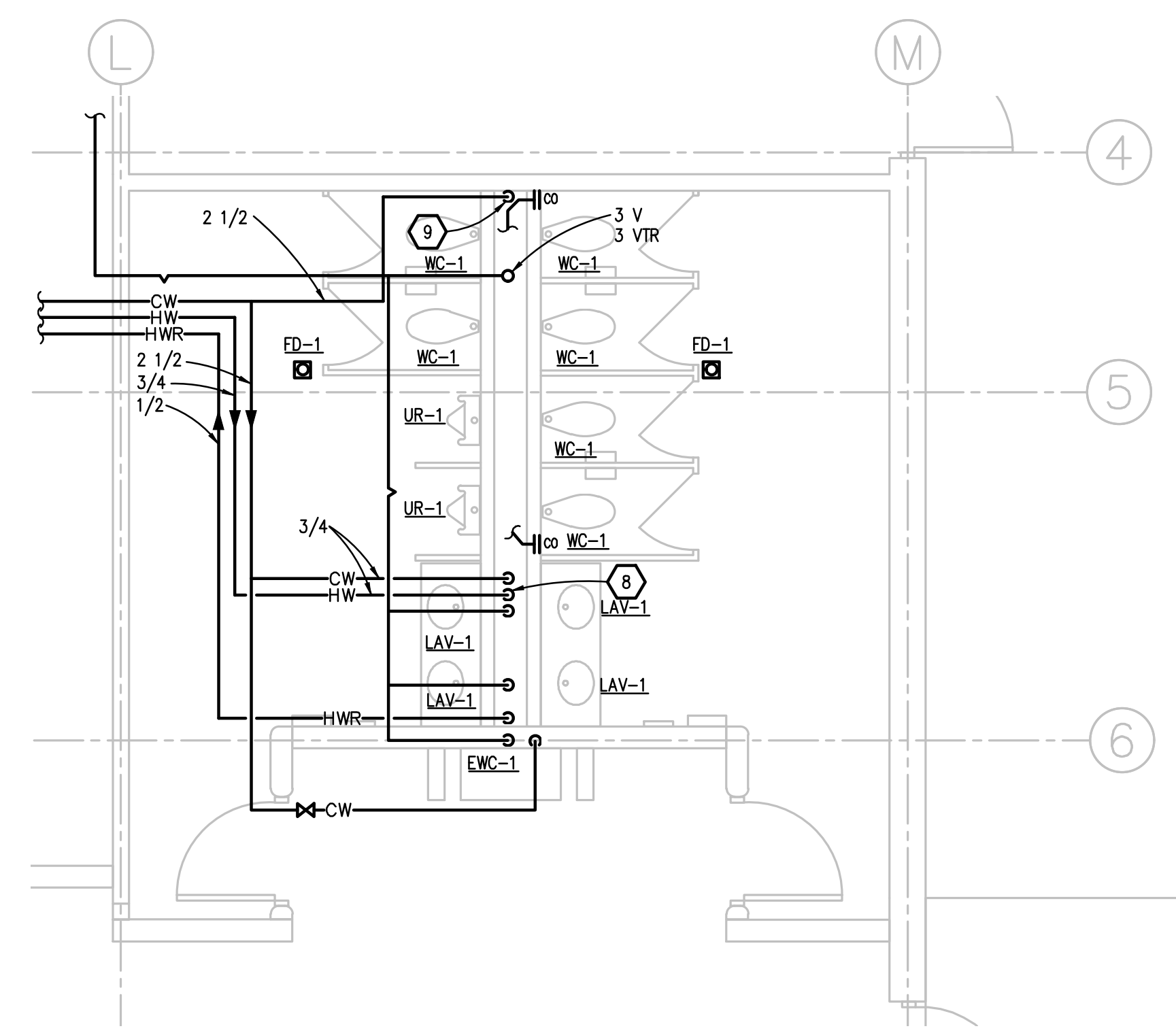
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CONSULTING ENGINEERS
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Tel: 248-878-5556 Fax: 248-878-0007
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FSA Project No. 20210363

DRAWING NUMBER	M-501
	MECHANICAL ENLARGED PLANS
DRAWING TITLE	MECHANICAL ENLARGED PLANS
SHEET NUMBER	71 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	BPC
DRAWN	BLT
CHECKED	BLT
APPROVED	DAC
PROJECT	RENOVATE ARMORY WASHTEWAW ARMORY
PROJECT INFORMATION NUMBER	PROJECT: WASHTEWAW ARMORY CONTRACT NUMBER: 121456 FILE NO. 511/21326.CAK DMA PROJECT NO. 2638022016
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR	

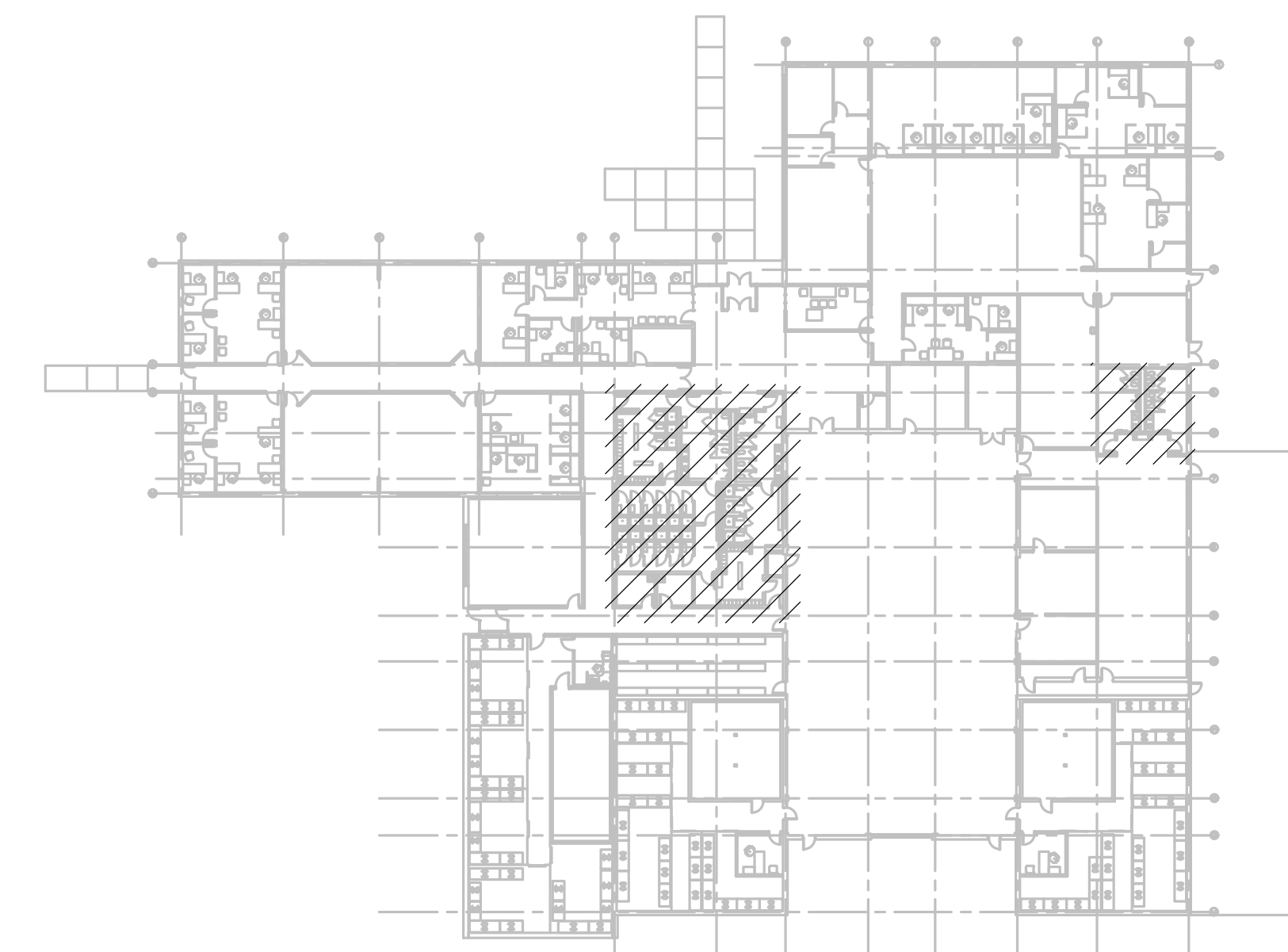
9:\2021\2021-0363-00\CAD\2021-0363-M5-EP2.dwg, M-502, 3/25/2022 2:15:52 PM, Devin J. Senechal, Peter Basso Associates Inc.



ENLARGED RESTROOMS, SHOWERS, AND LOCKER ROOMS
SCALE: 1/4" = 1' - 0"



ENLARGED RESTROOMS
SCALE: 1/4" = 1' - 0"



KEY PLAN
NO SCALE

PLUMBING GENERAL NOTES:

- THESE DRAWINGS ARE DIAGRAMMATIC, AND REPRESENT THE GENERAL INTENT AND ARRANGEMENT OF SYSTEMS. THEY ARE NOT TO BE CONSIDERED FABRICATION/COORDINATION/SHOP DRAWINGS. COORDINATION WITH OTHER TRADES IS REQUIRED. PROVIDE THE ADDITIONAL FITTINGS AND OFFSETS THAT WILL BE REQUIRED TO COMPLETE EACH SYSTEM AND TO AVOID INTERFERENCES WITH ALL OTHER SYSTEMS INCLUDING THE STRUCTURE, SHEET METAL, OTHER PIPING SYSTEMS, ELECTRICAL CONDUITS, BUS DUCTS, CABLE TRAY, LIGHT FIXTURES, ETC. AND/OR OTHER SPACE CONSTRAINTS.
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- PROVIDE CODE REQUIRED CLEARANCE FOR ALL CLEANOUTS INSTALLED IN SANITARY WASTE AND VENT PIPING.
- MINIMUM UNDERGROUND PIPE SIZE SHALL BE 3".

CONSTRUCTION KEY NOTES:

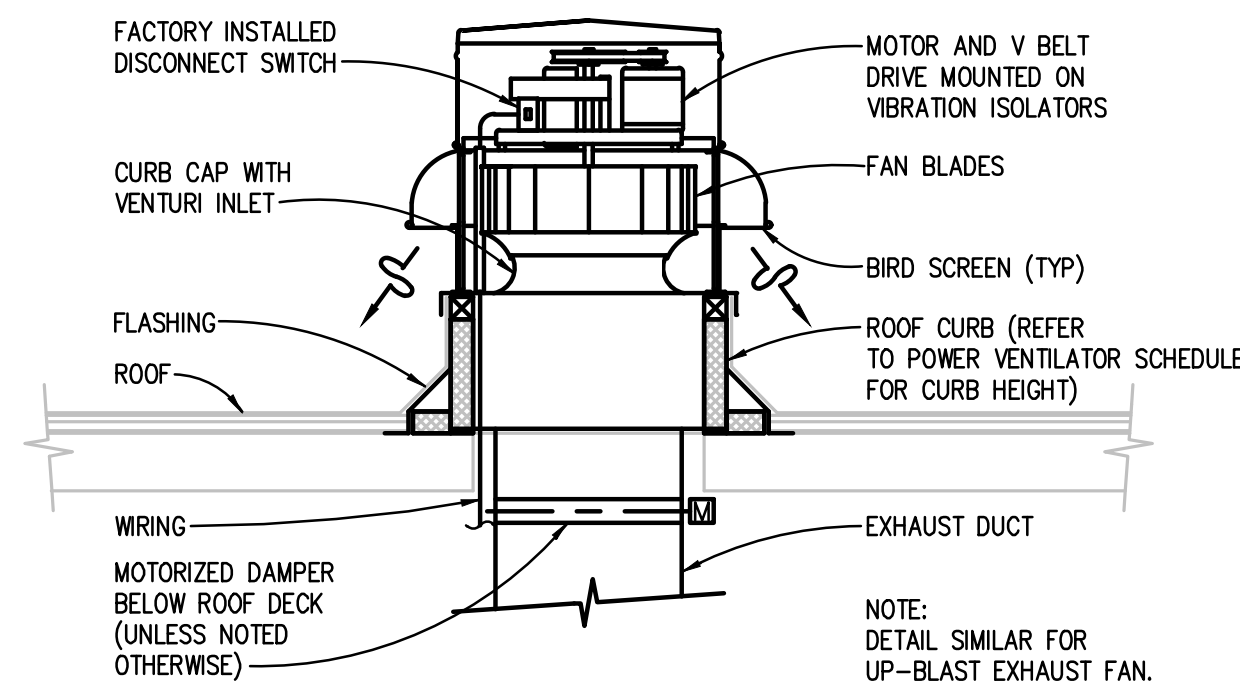
- 3 SAN TO SHOWER DRAIN.
- 3 SAN TO FD.
- NOT USED.
- 3 SAN TO LAV.
- 3 SAN TO JC.
- 4 SAN TO CHASE.
- 3 SAN TO EWC.
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- TERMINATE CONDENSATE OVER JANITORS CLOSET SINK OR AT CODE REQUIRED DISTANCE ABOVE FLOOR DRAIN/SINK

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

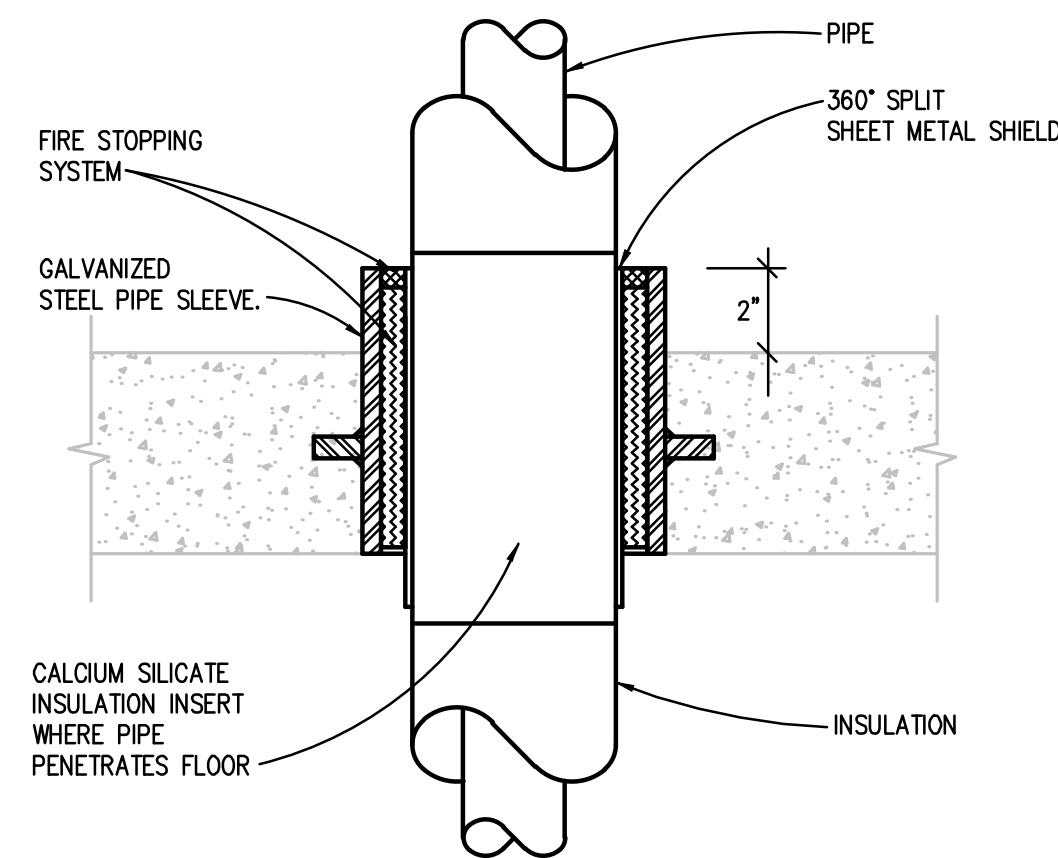
STATE OF MICHIGAN
DAVID ANTHONY CONRAD
ENGINEER
No. 6201055589

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5145 Livernois, Suite 100
Troy, Michigan 48069-3276
Tel: 248-878-5556
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FSA-P001 No. 002/005

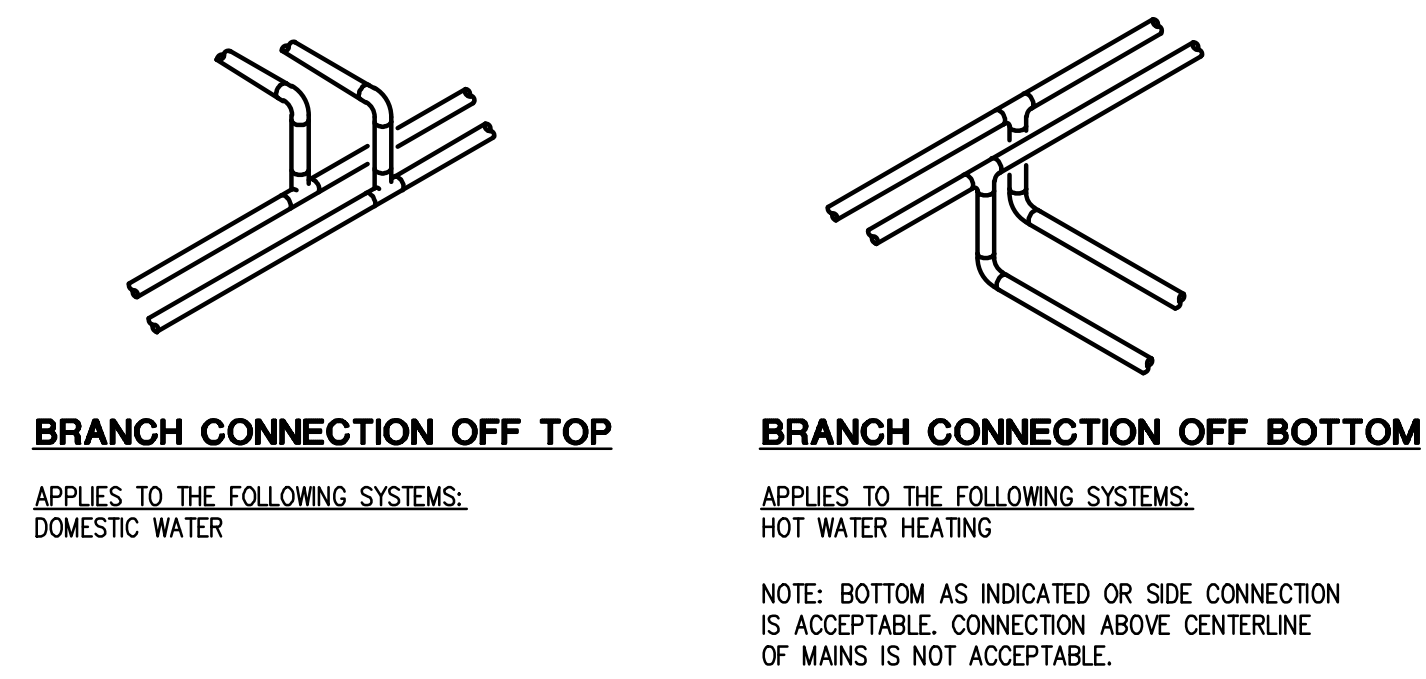
DRAWING NUMBER	M-502
	M-502
DRAWING TITLE	MECHANICAL ENLARGED PLANS
SHEET NUMBER	72 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DESIGNED	BPC
DRAWN	CHECKED
PROJECT	RENOVATE ARMORY WASHTEWAW ARMORY
DESIGNER	FORBES
STATE OF MICHIGAN	DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR



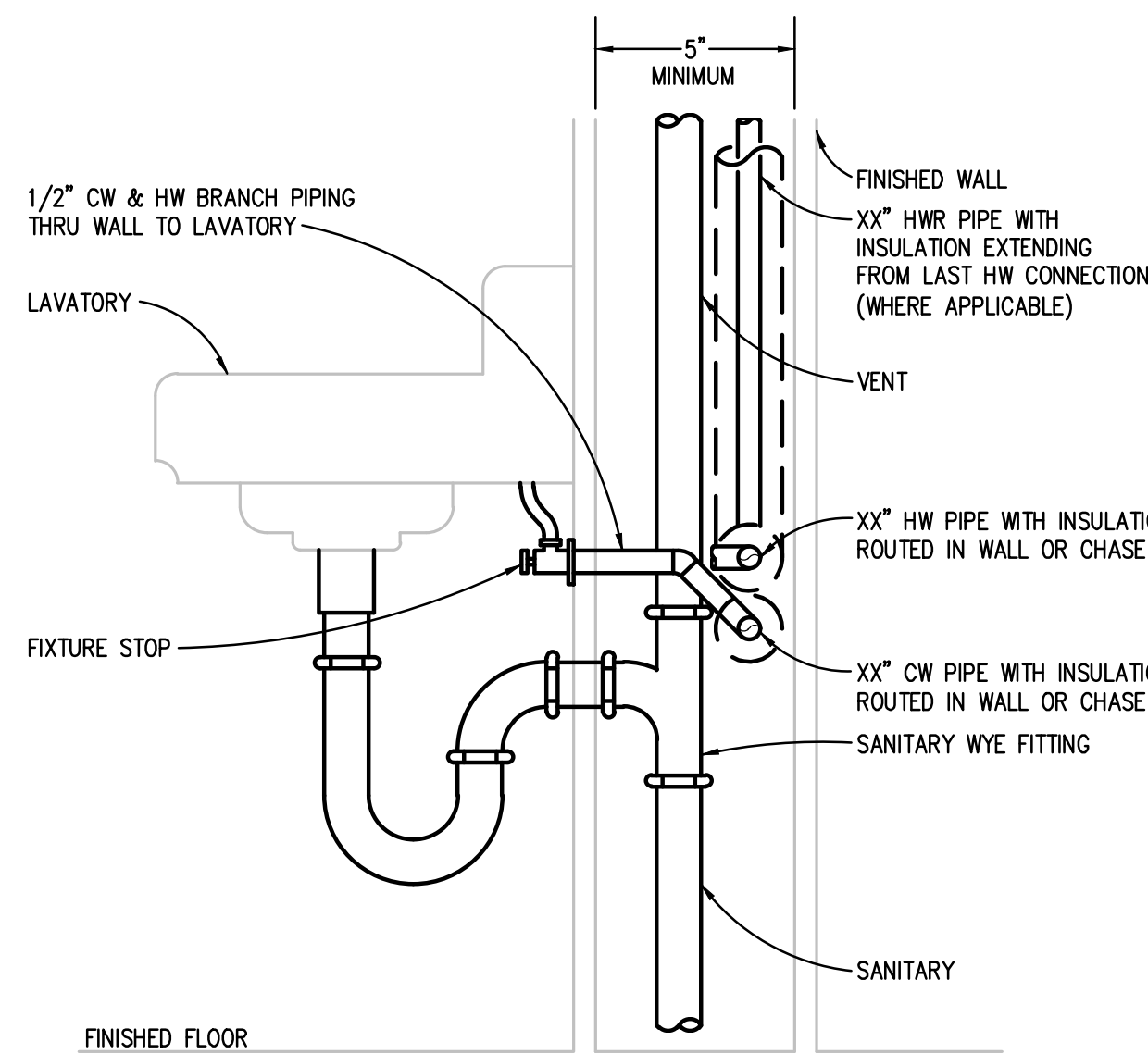
ROOF MOUNTED POWER VENTILATOR EXHAUST FAN DETAIL
NO SCALE



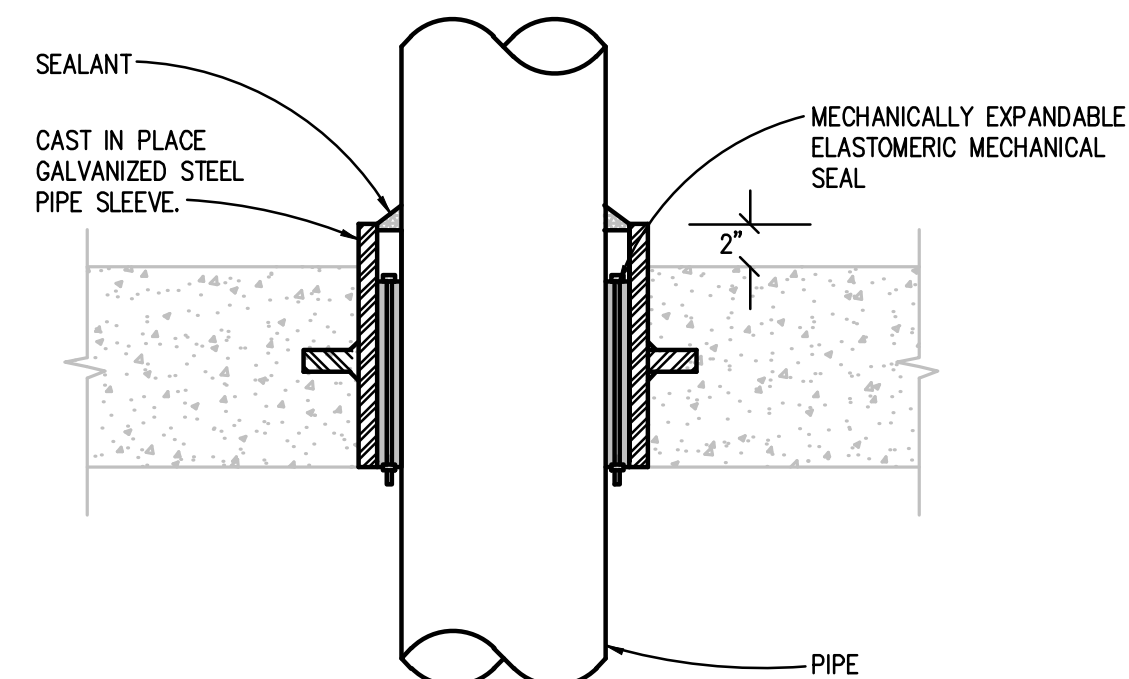
NEW FLOOR PIPE PENETRATION DETAIL
NO SCALE



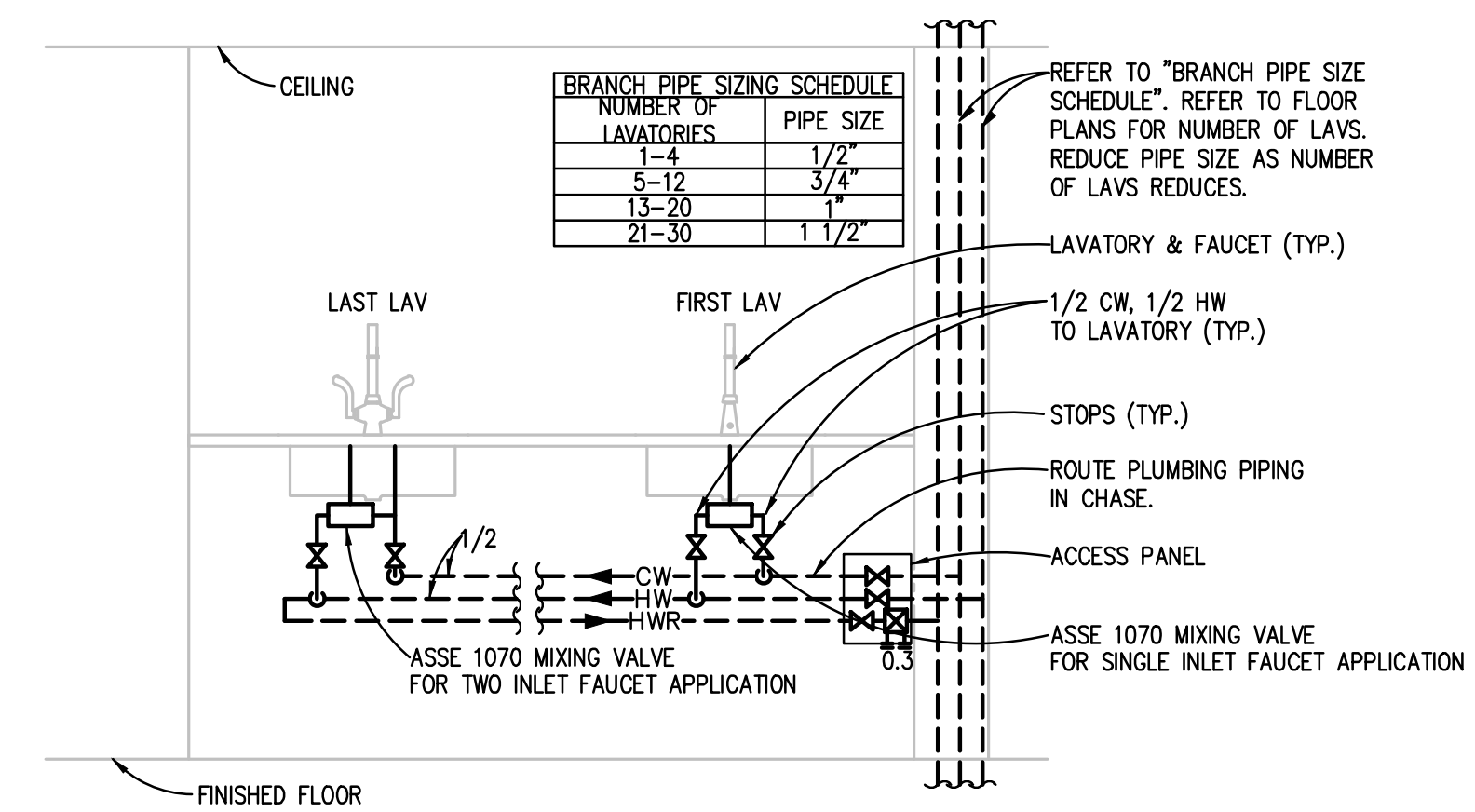
TYPICAL BRANCH TAKE-OFF CONNECTION PIPING DETAIL
NO SCALE



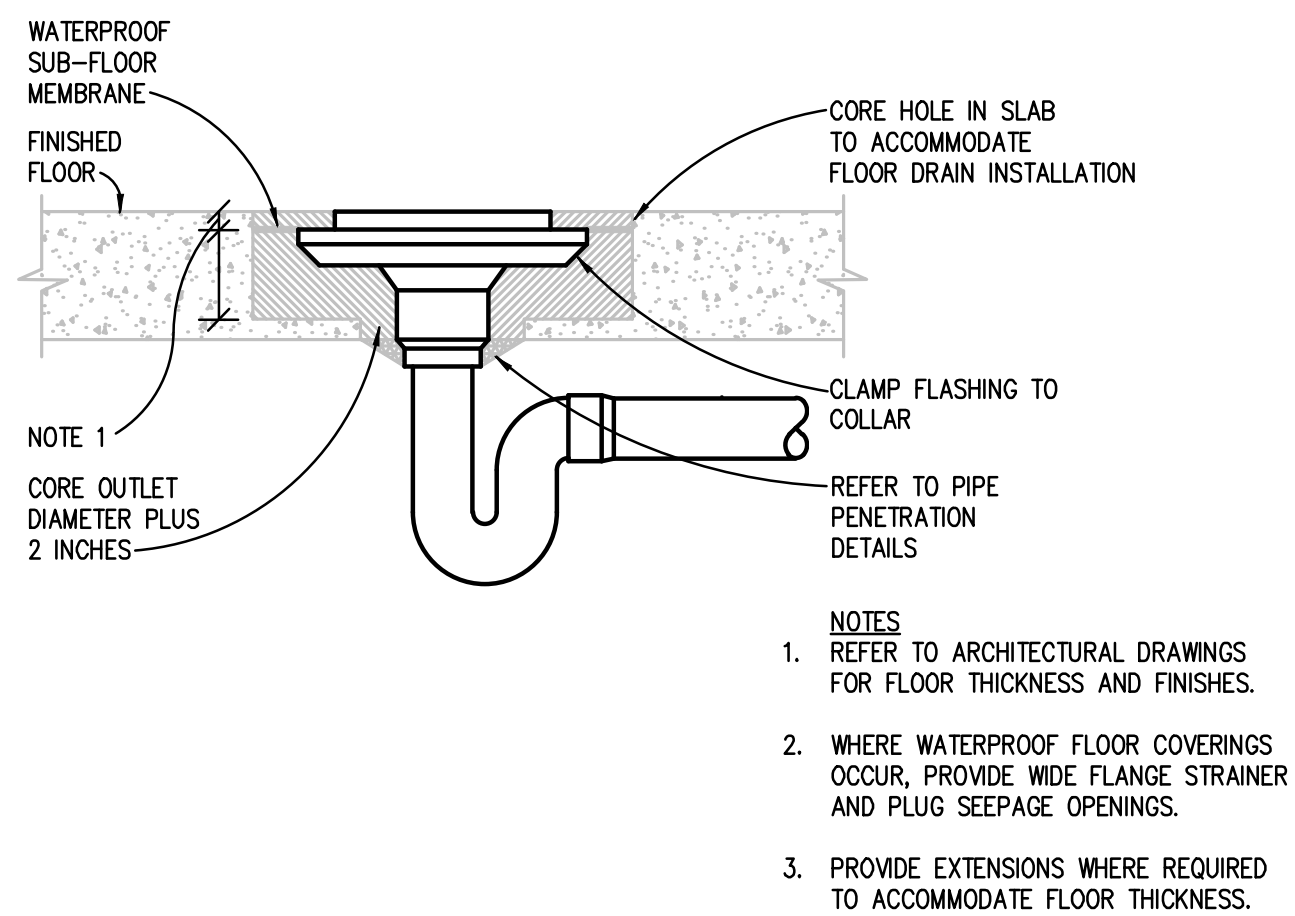
TYPICAL LAVATORY DETAIL
NO SCALE



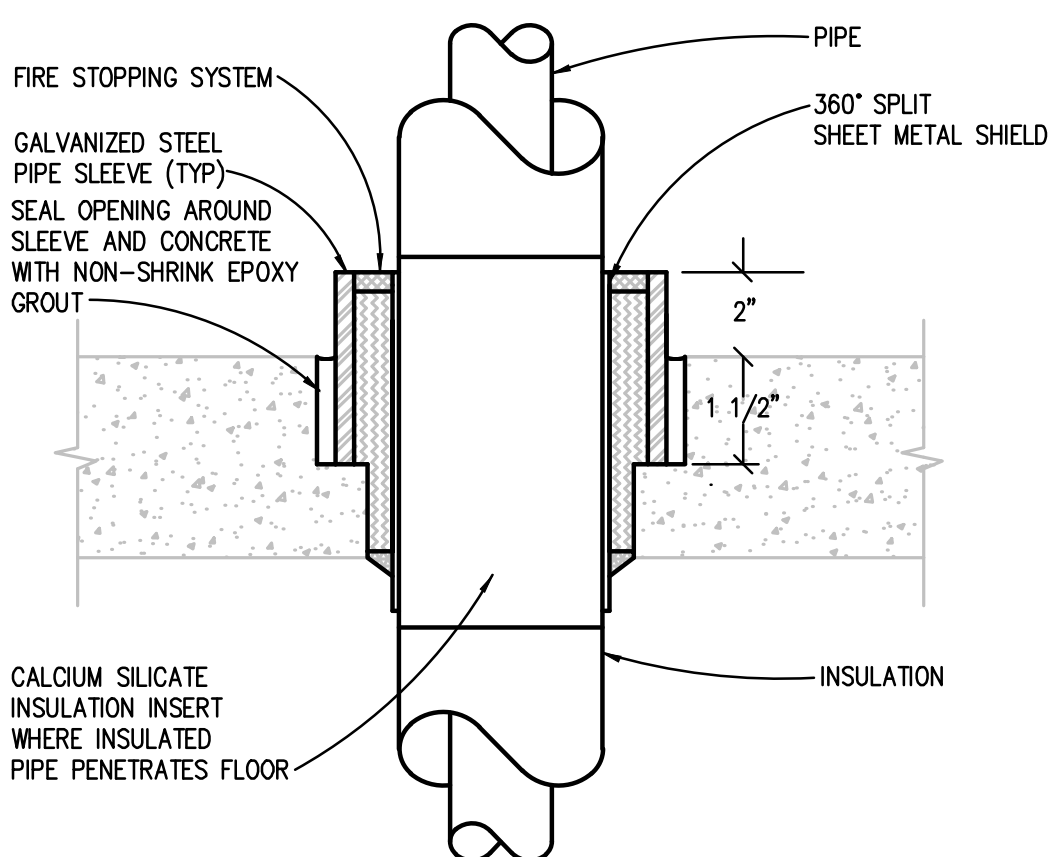
NEW SLAB ON GRADE FLOOR PIPE PENETRATION DETAIL
NO SCALE



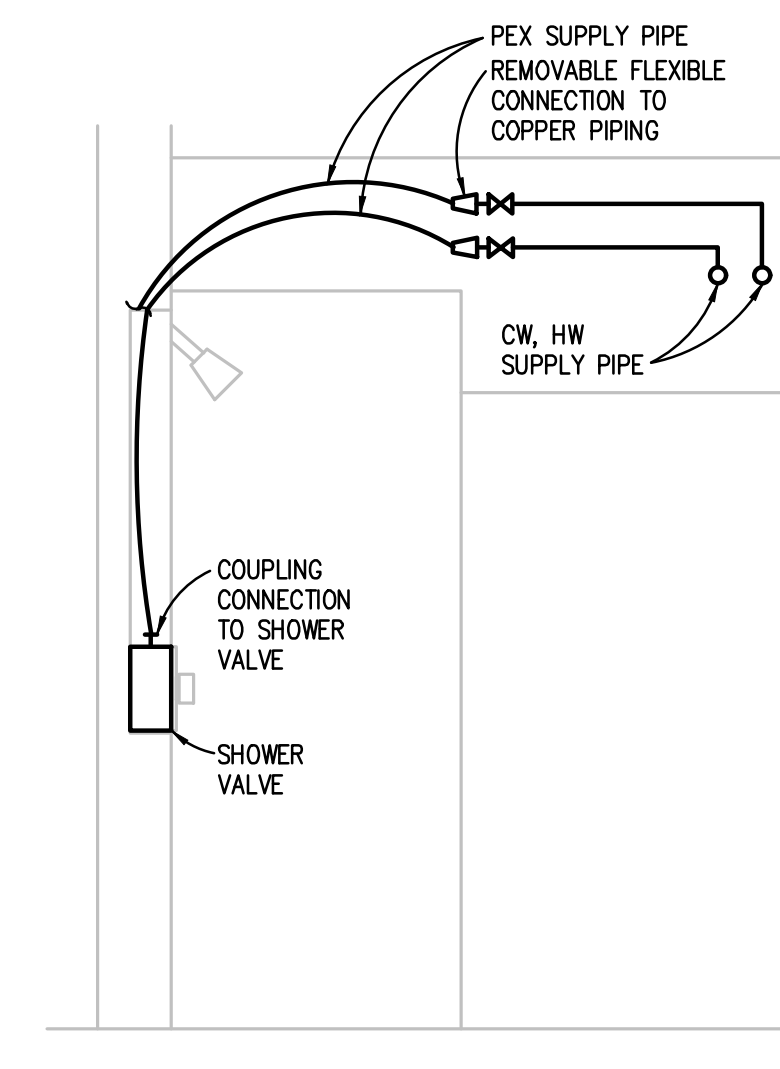
LAVATORY DOMESTIC WATER PIPING DIAGRAM
NO SCALE
NOTE: FOR USE IN MENS AND WOMENS CORE TOILET ROOMS



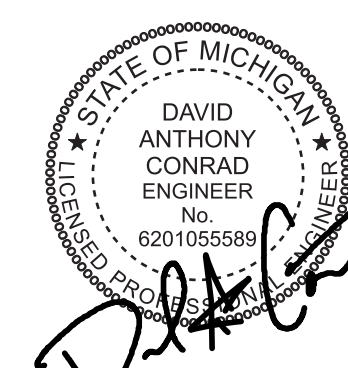
FLOOR DRAIN DETAIL (EXISTING FLOORS)
NO SCALE



EXISTING FLOOR PIPE PENETRATION DETAIL
NO SCALE



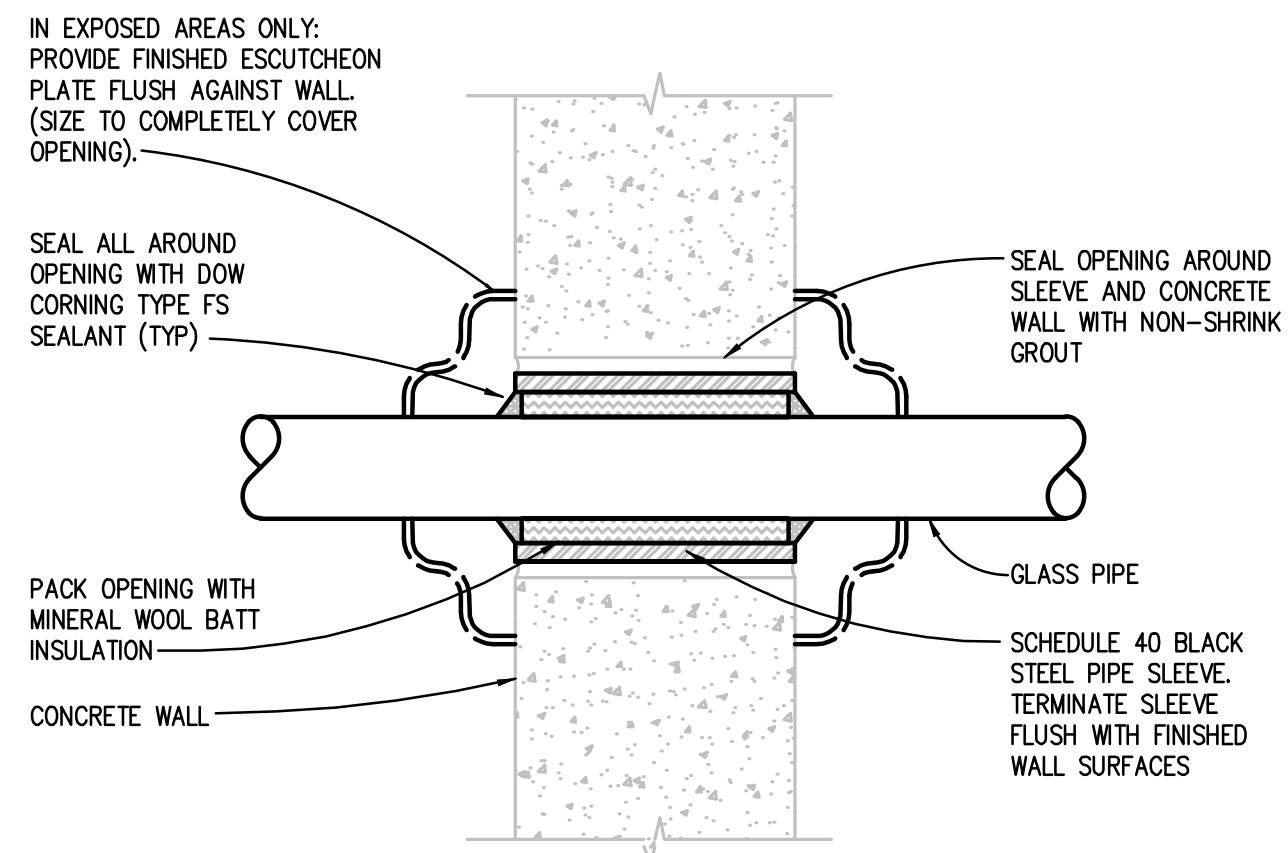
TYPICAL SHOWER CONNECTION DETAIL
NO SCALE



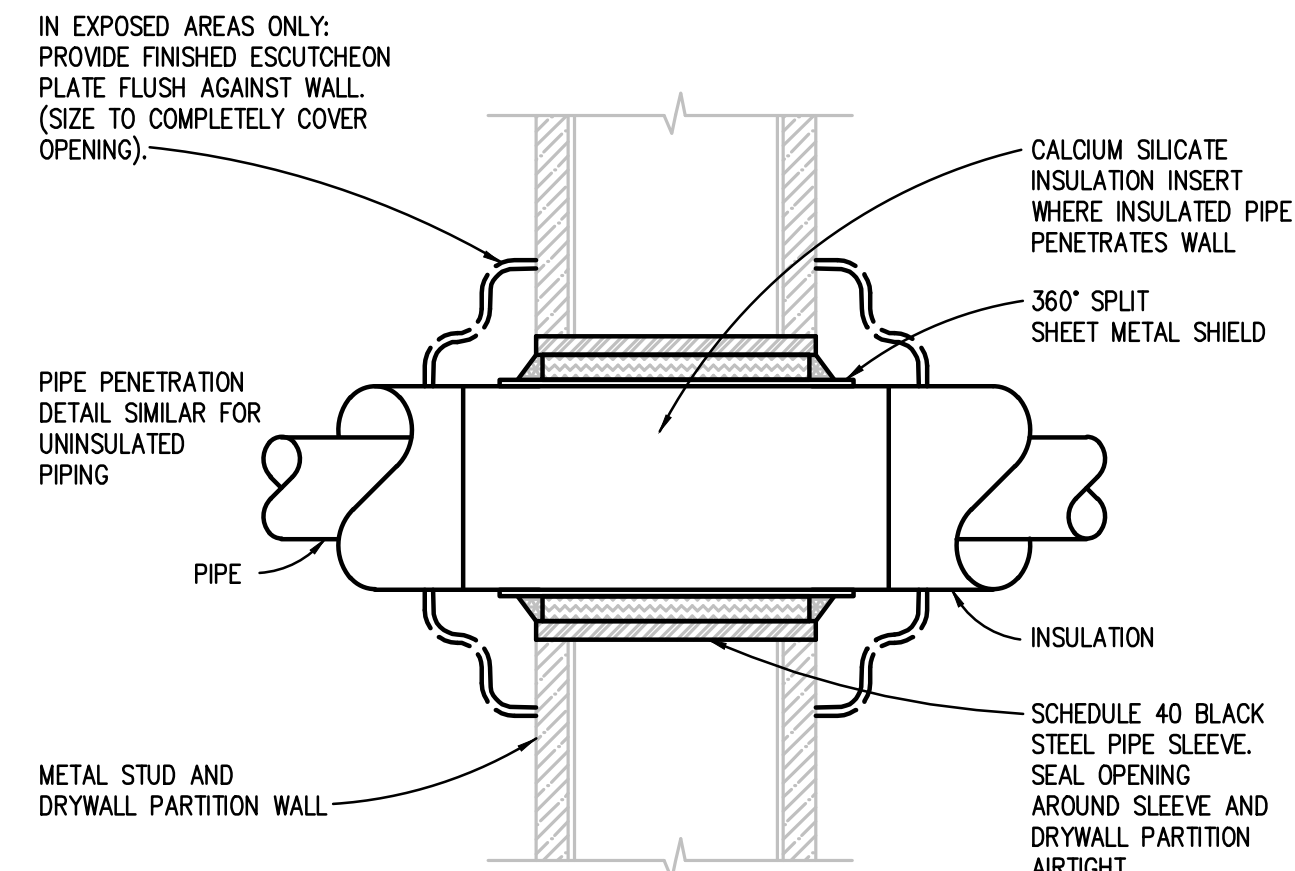
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CONSULTING ENGINEERS
5145 Livernois, Suite 100
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PBA Project No. 0021206

DRAWING NUMBER	M-601
	M-601
DRAWING TITLE	MECHANICAL DETAILS
SHEET NUMBER	73 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DRAWN	RLT
CHECKED	DAC
DESIGNED	DAC
APPROVED	DAC
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR	

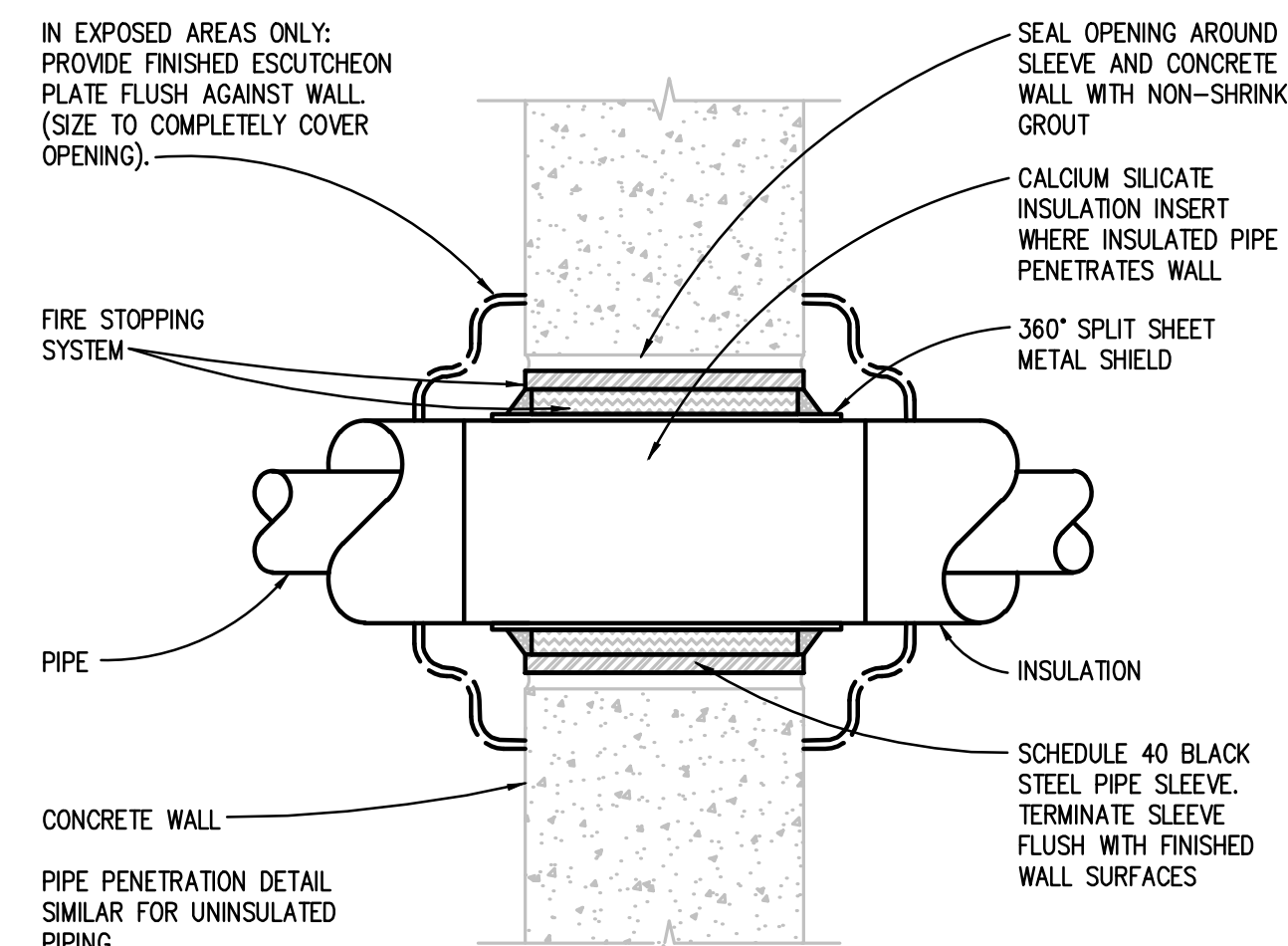
9:\2021\2021-0363-00\CAD\2021-0363-M6-DT.dwg, M-601, 3/25/2022 2:15:58 PM, Devin J. Senetral, Peter Basso Associates Inc.



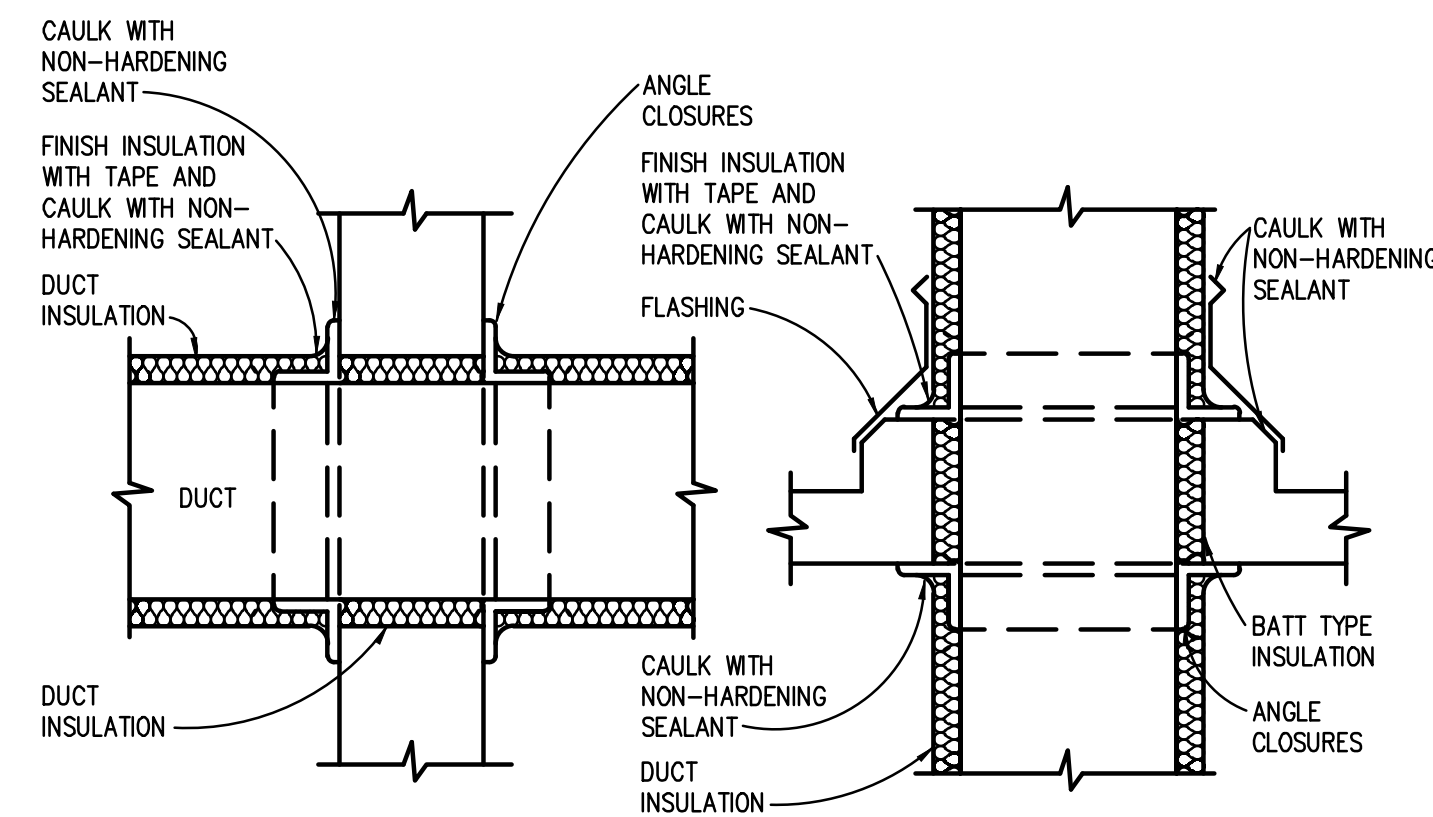
POURED CONCRETE OR BLOCK WALL (FIRE RATED ASSEMBLY) GLASS PIPE PENETRATION DETAIL
NO SCALE



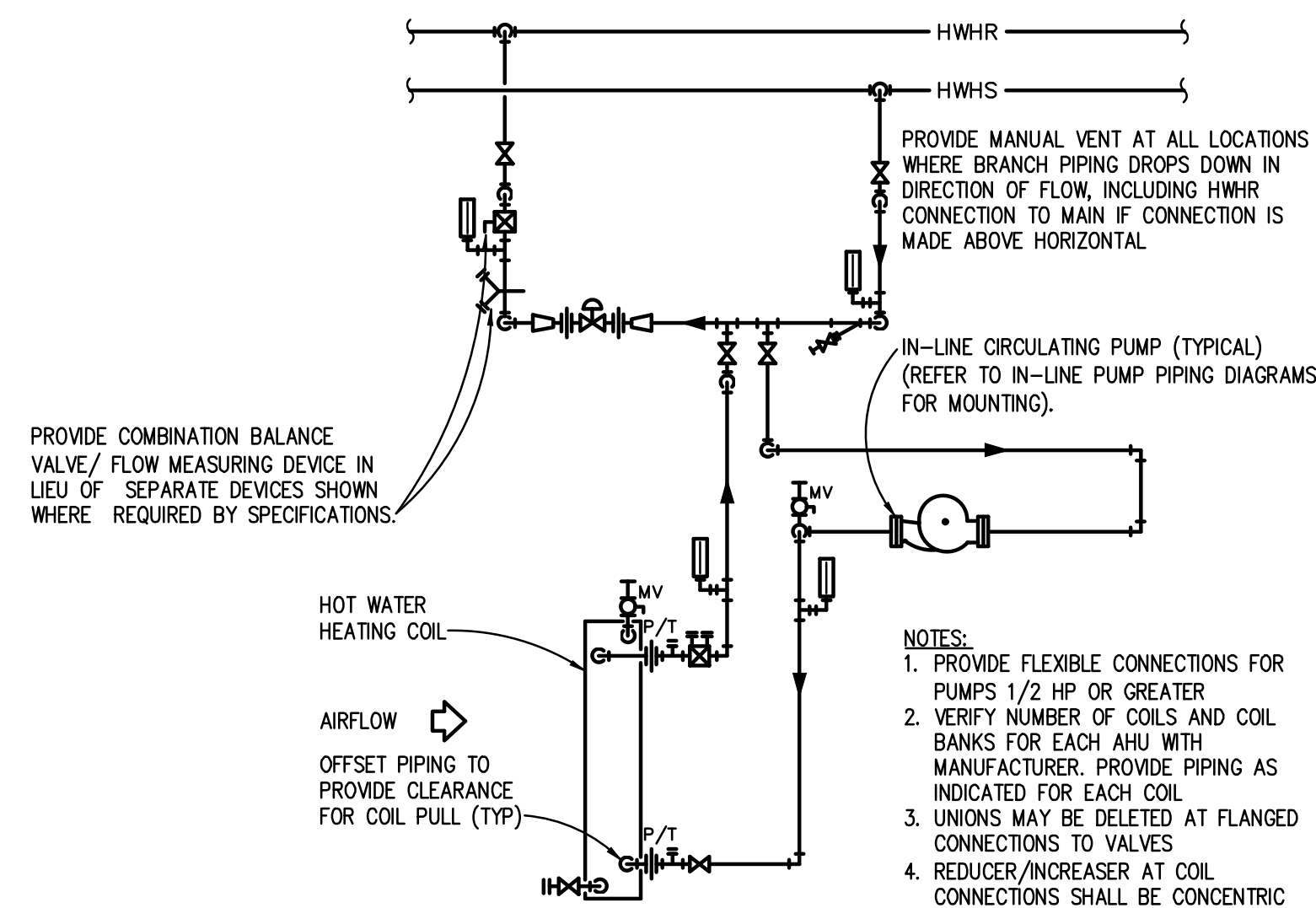
FIRE RATED AND NON-FIRE RATED METAL STUD AND DRYWALL PARTITION WALL PIPE PENETRATION DETAIL
NO SCALE



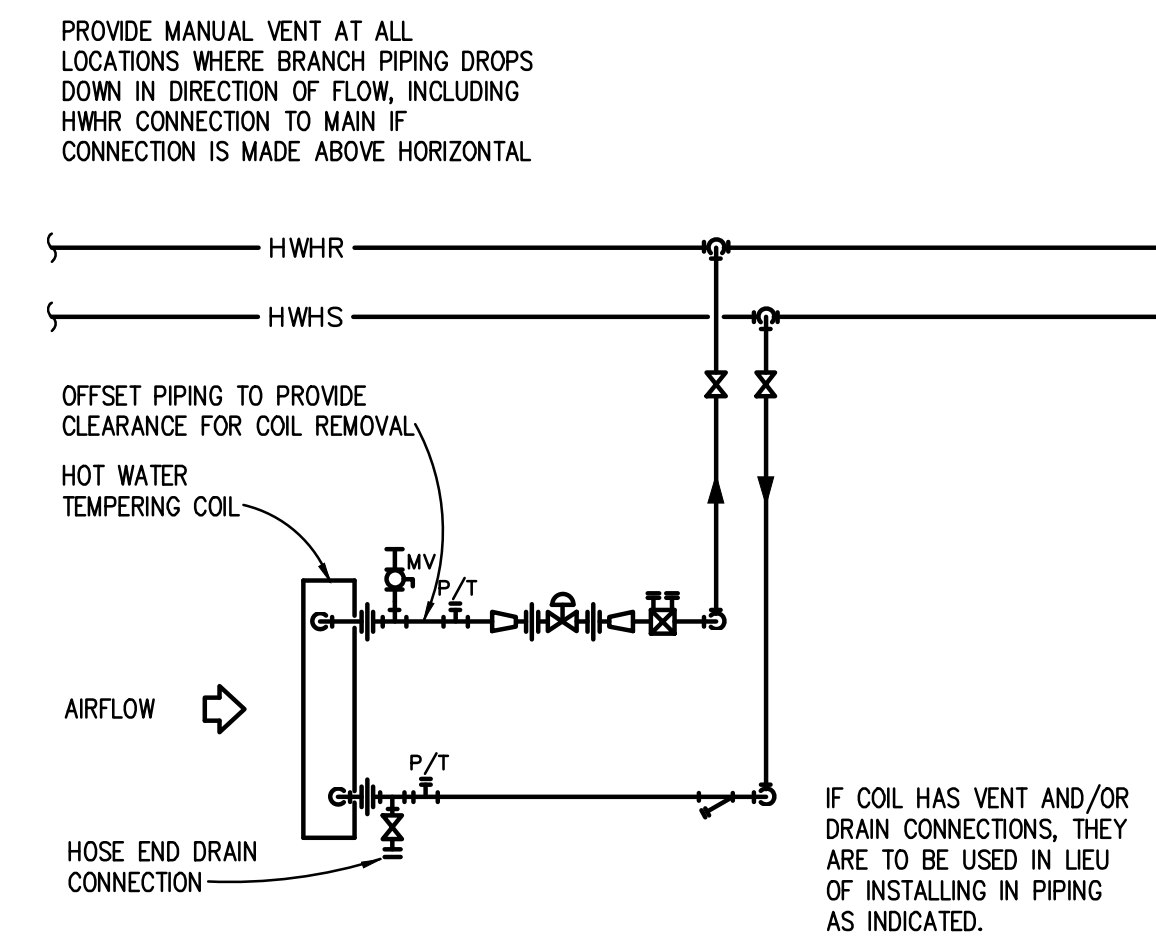
FIRE RATED AND NON-FIRE RATED POURED CONCRETE OR BLOCK WALL PIPE PENETRATION DETAIL
NO SCALE



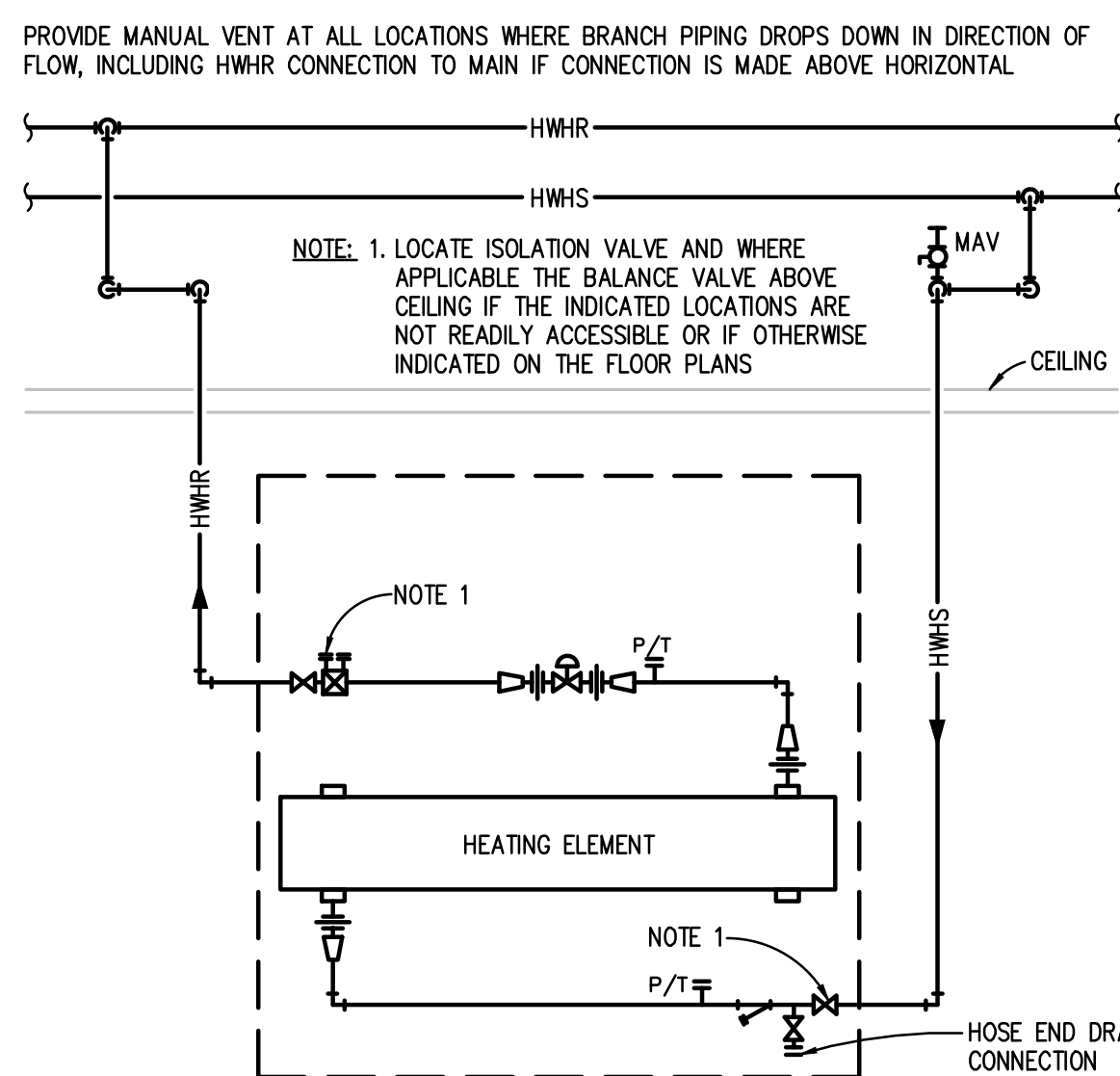
VERTICAL OR HORIZONTAL (NON FIRE RATED ASSEMBLY) DUCT PENETRATION DETAIL
NO SCALE



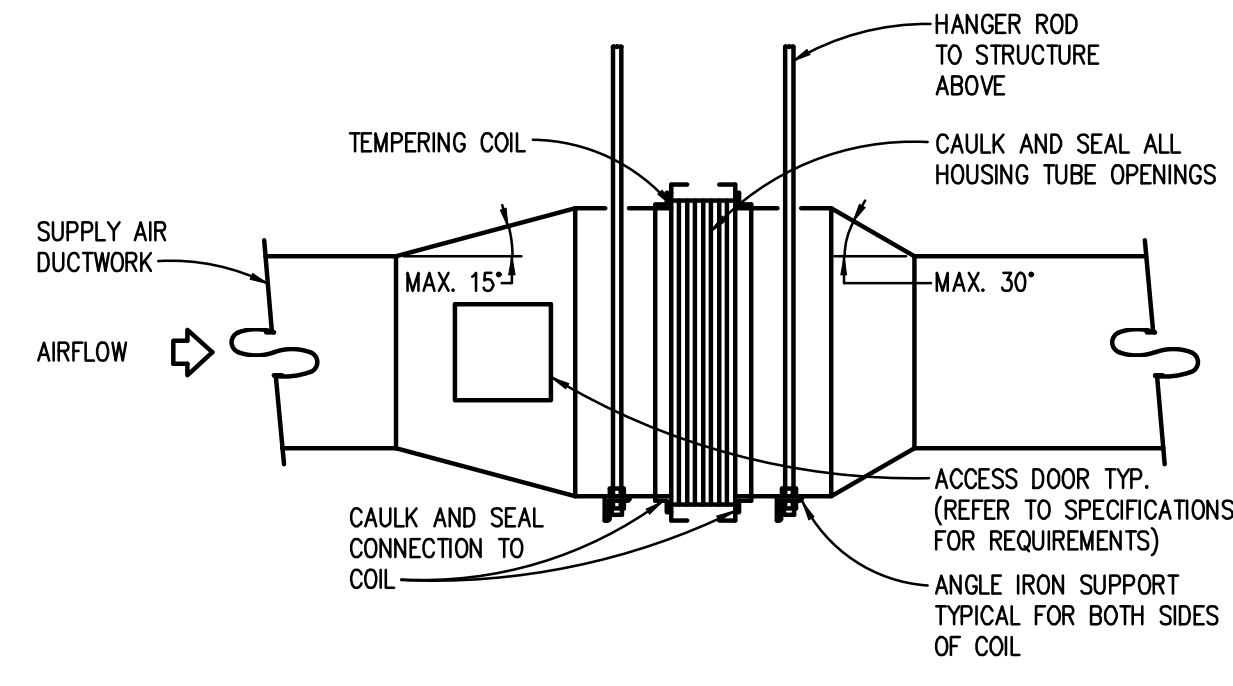
BCU-2 HOT WATER HEATING COIL PIPING DIAGRAM
NO SCALE



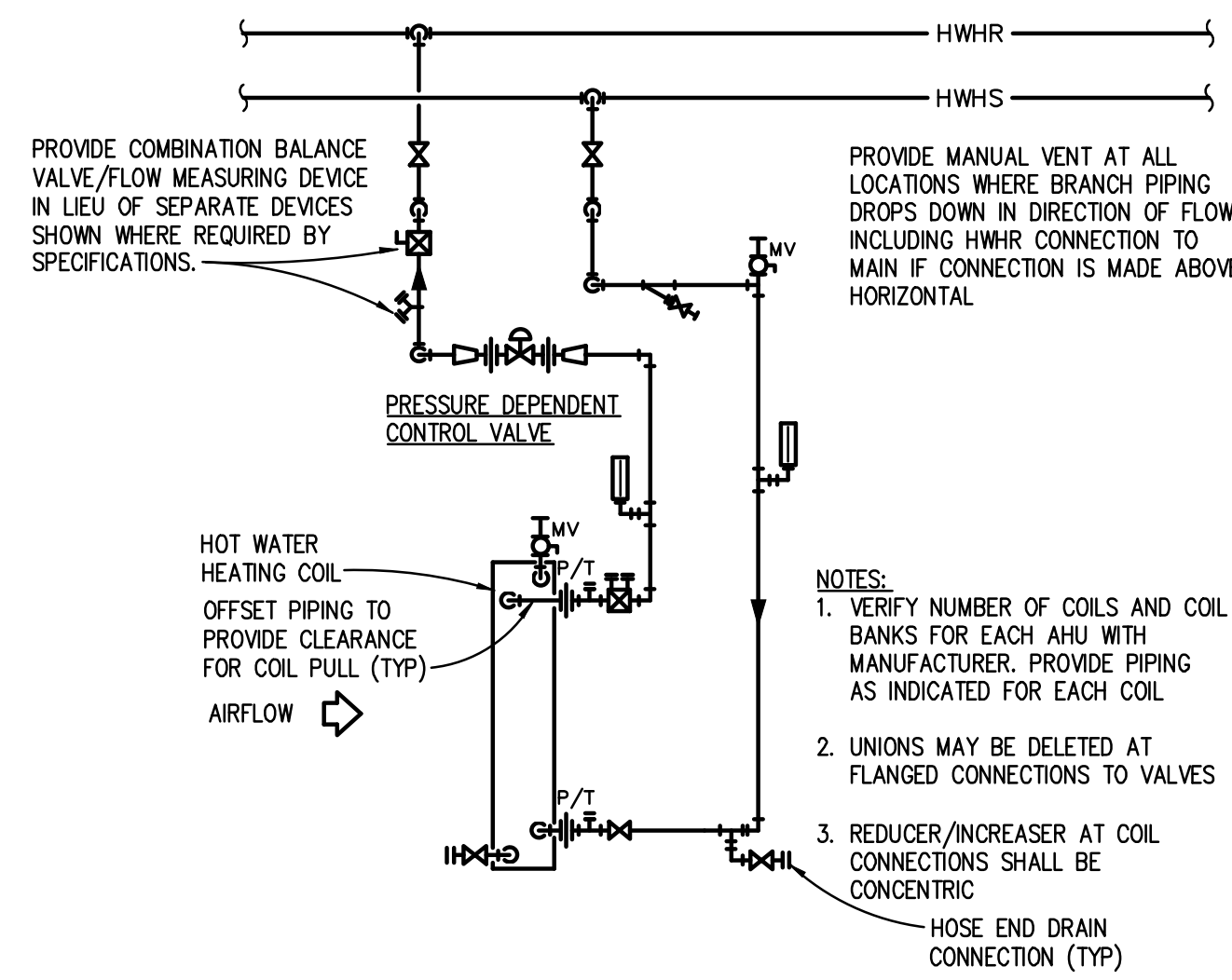
HOT WATER TEMPERING COIL WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM
NO SCALE



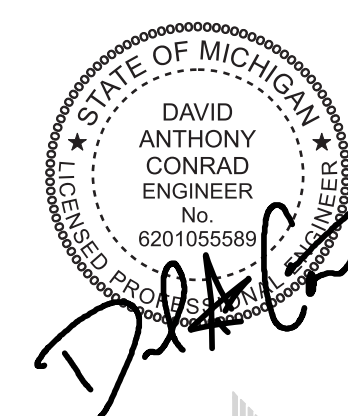
DOWNFEED CONV. OR CUH WITH TWO-WAY CONTROL VALVE PIPING DIAGRAM
NO SCALE



DUCT MOUNTED TEMPERING COIL INSTALLATION DETAIL
NO SCALE



BCU-1 HOT WATER HEATING COIL PIPING DIAGRAM
NO SCALE



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Troy, Michigan 48069-3276
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FSA-P-001-000

DRAWING NUMBER		DRAWING TITLE		MECHANICAL DETAILS		SHEET NUMBER		IDENTIFICATION NUMBER		ISSUED FOR		DATE		DESIGNED		PROJECT	
M-602		MECHANICAL DETAILS		74 OF 95		CONTRACT NUMBER: 121456 FILE NO. 511/21326.0A DWG PROJECT NO. 2628022016		CONSTRUCTION DOCUMENTS		04/01/2022		RLT CHECKED DAC APPROVED DAC		RENOVATE ARMORY ARMORY			

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

816 E 4th St.
Troy, MI 48067
248-842-7866 / www.prfac.com

FORBES
ARCHITECTURAL ADMINISTRATION

PROJECT: RENOVATE ARMORY
ARMORY

DATE: 04/01/2022

ISSUED FOR: CONSTRUCTION DOCUMENTS

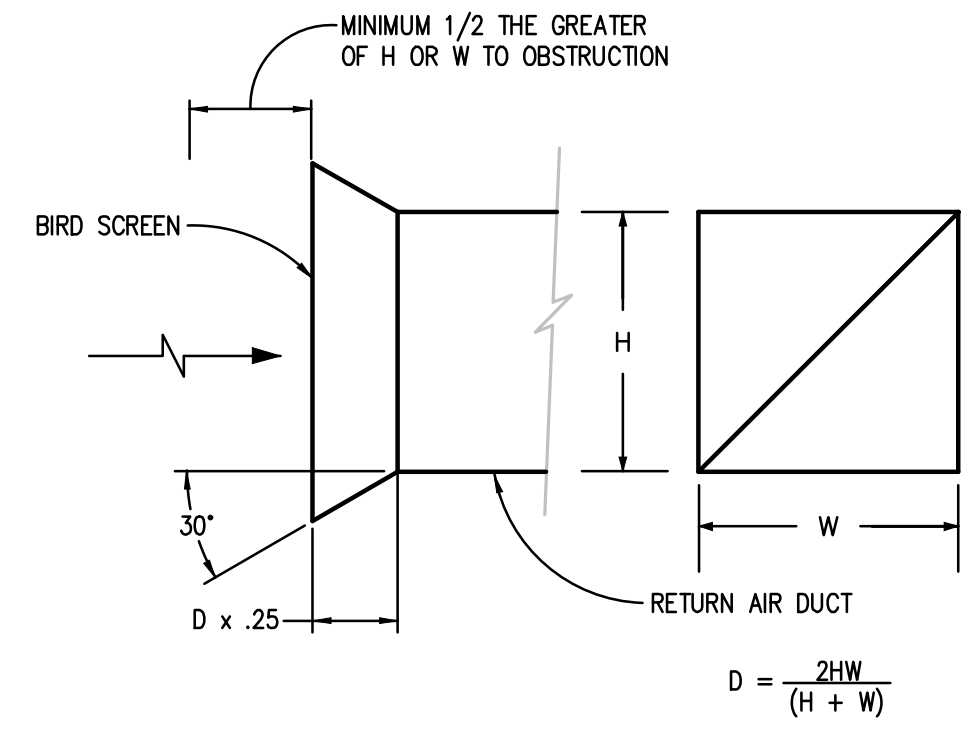
SHEET NUMBER: 74 OF 95

DRAWING TITLE: MECHANICAL DETAILS

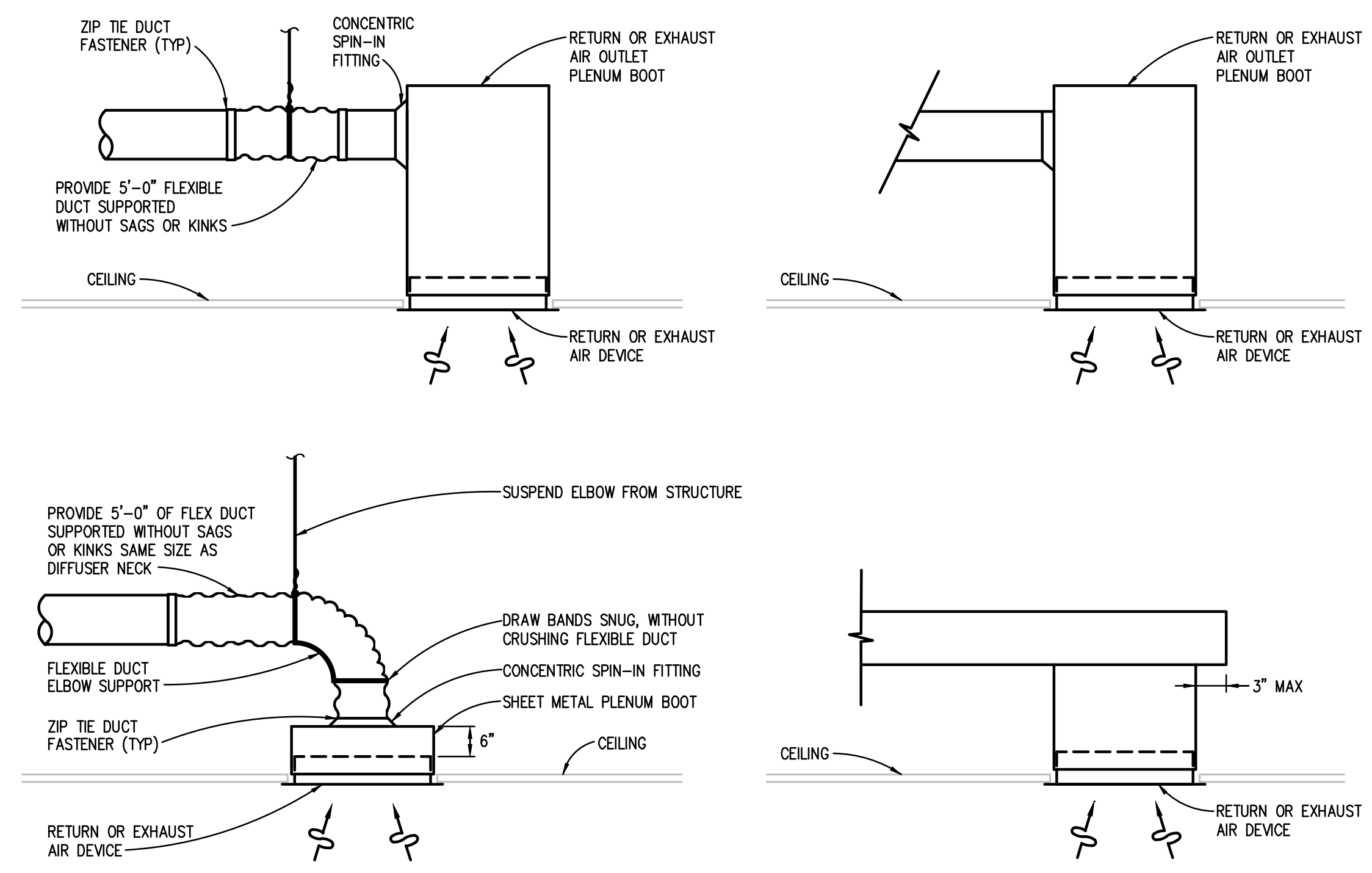
M-602

9:\2021\2021-0363-00\CAD\2021-0363-M6-DT.dwg, M-602, 3/25/2022 2:16:00 PM, Devin J. Senetral, Peter Basso Associates Inc.

g:\2021\2021-0363-00\CAD\2021-0363-M6-DT.dwg, M-603, 3/25/2022 2:16:01 PM, Devin J. Senetchal, Peter Bosso Associates Inc.

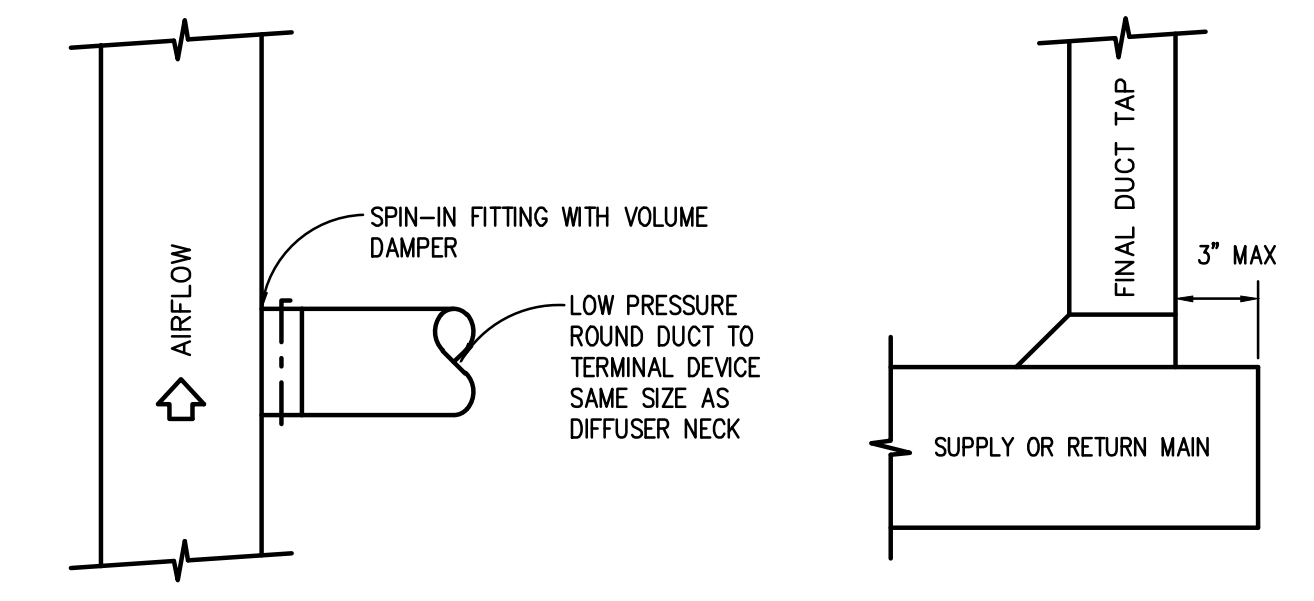


BELLMOUTH DETAIL
NO SCALE

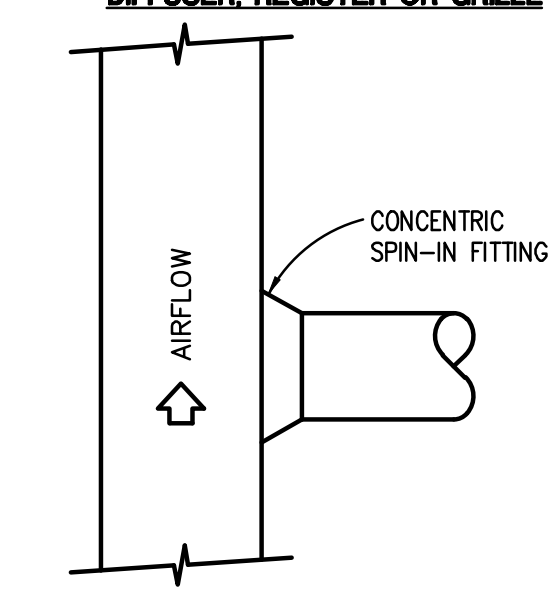


RETURN OR EXHAUST AIR DEVICE INSTALLATION DETAIL
NO SCALE

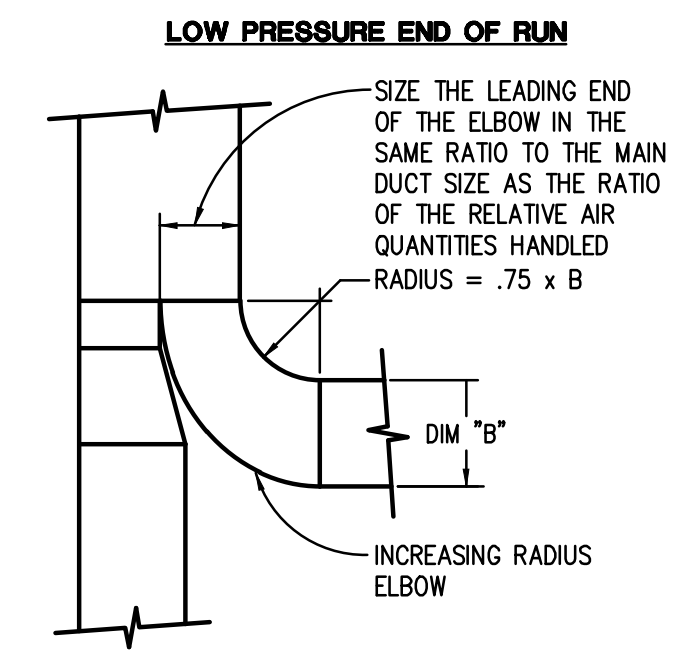
NOTE: PAINT INTERIOR SURFACE OF PLENUM BOX FLAT BLACK.



LOW PRESSURE INLET/OUTLET TO/FROM DIFFUSER, REGISTER OR GRILLE

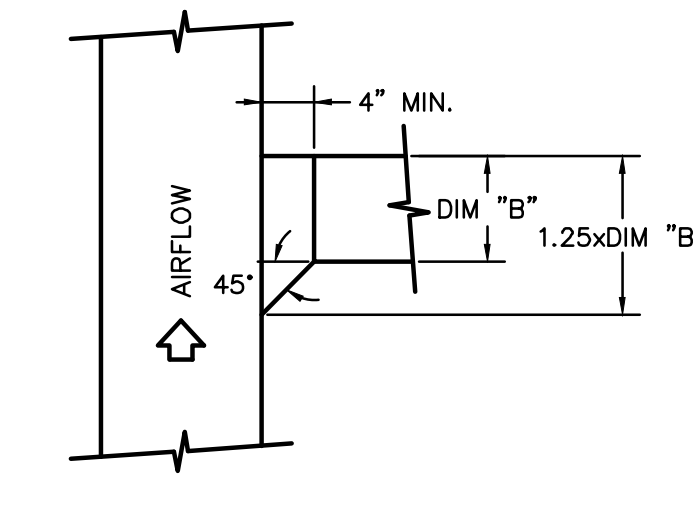


RECTANGULAR TO ROUND DUCT

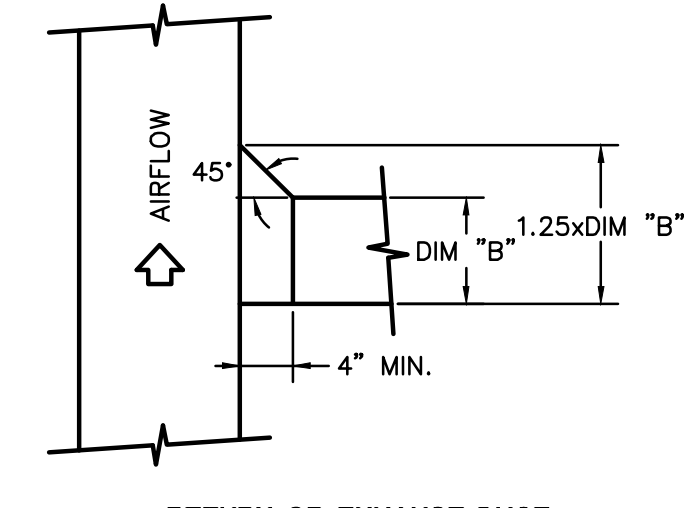


SUPPLY, RETURN OR EXHAUST DUCT

FOR USE WHEN A BRANCH TAKE-OFF IS TO HANDLE MORE THAN 25% OF THE AIR HANDLED BY THE MAIN DUCT

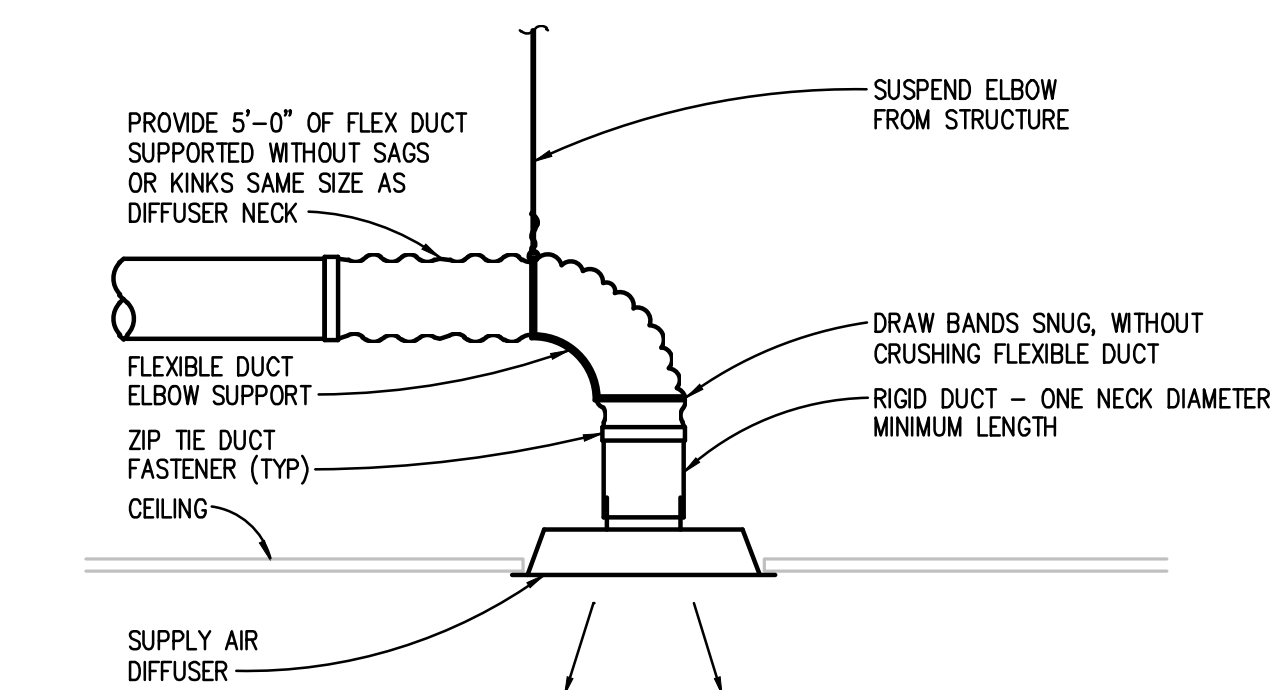
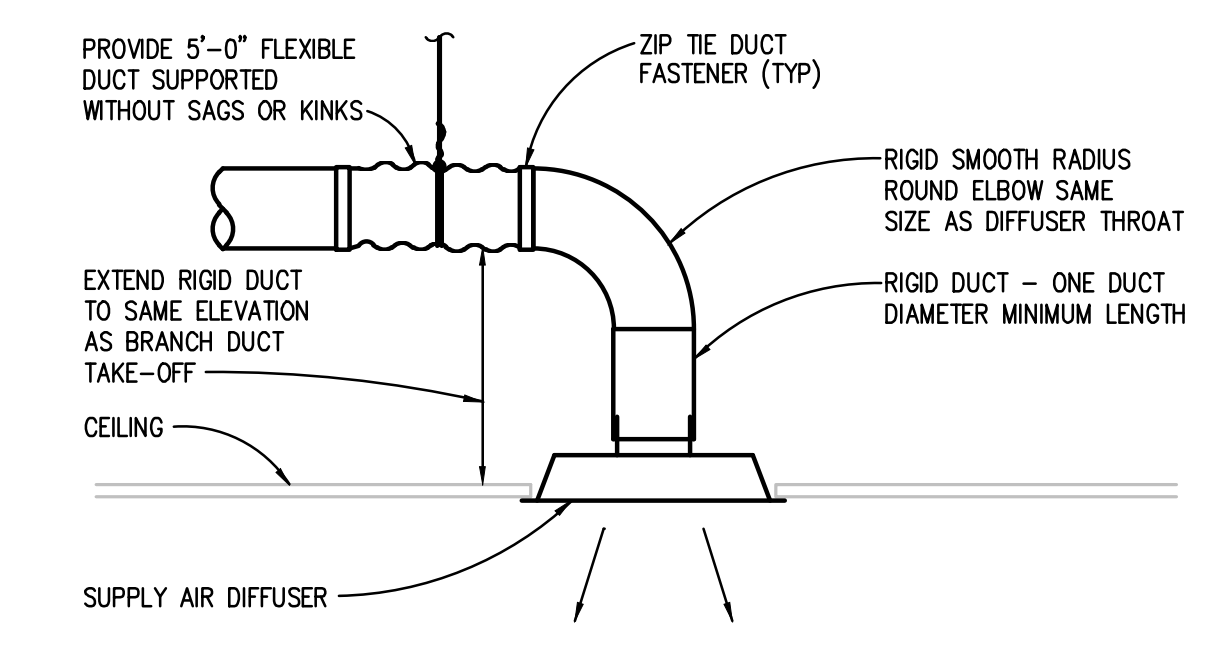


SUPPLY DUCT



RETURN OR EXHAUST DUCT

RECTANGULAR DUCT BRANCH TAKE-OFF DETAILS
NO SCALE



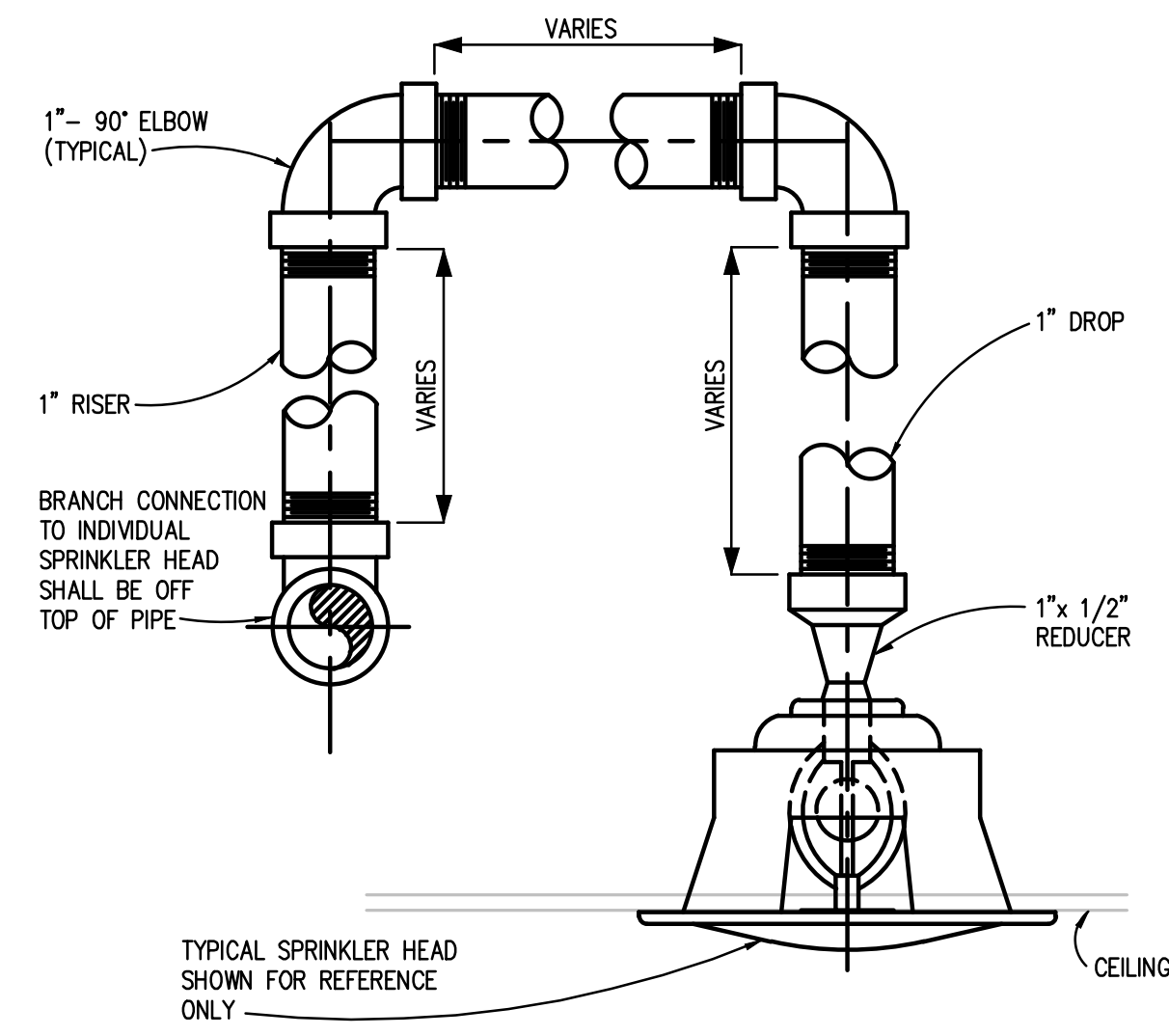
ROUND NECK SUPPLY AIR DIFFUSER DETAIL
NO SCALE



Peter Bosso Associates Inc.
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5145 Livernois, Suite 100
Troy, Michigan 48069-3276
Tel: 248-878-5556
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PBA Project No. 0021205

DRAWING NUMBER	M-603	DRAWING TITLE	MECHANICAL DETAILS	SHEET NUMBER	75 OF 96	IDENTIFICATION NUMBER	PROJECT: WASHTEENAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.02A DWG PROJECT NO. 2463802016	ISSUED FOR	CONSTRUCTION DOCUMENTS	DATE	04/01/2022	DESIGNED	RLT	PROJECT	RENOVATE ARMORY WASHTEENAW ARMORY	FORBES	816 E 4th ST. 48067 248.842.7666/www.pba.com	STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR
	DRAWN		CHECKED		DAC		APPROVED		DAC									

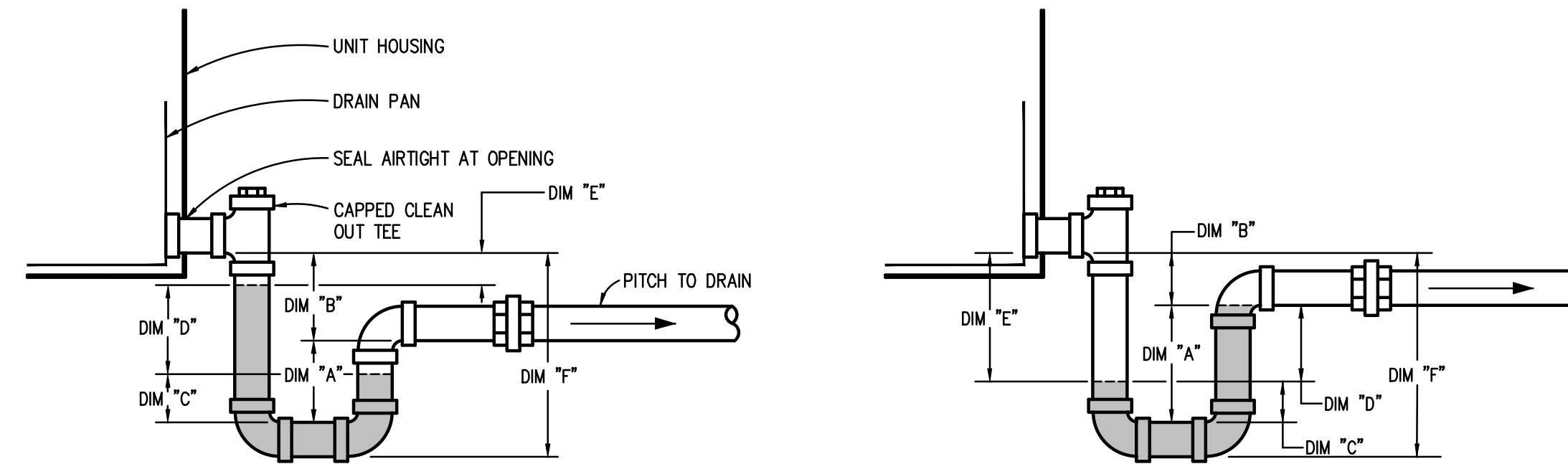
9:\2021\2021-0363-00\CAD\2021-0363-M6-DT.dwg, M-604, 3/25/2022 2:16:01 PM, Devin J. Senetchal, Peter Bosso Associates Inc.



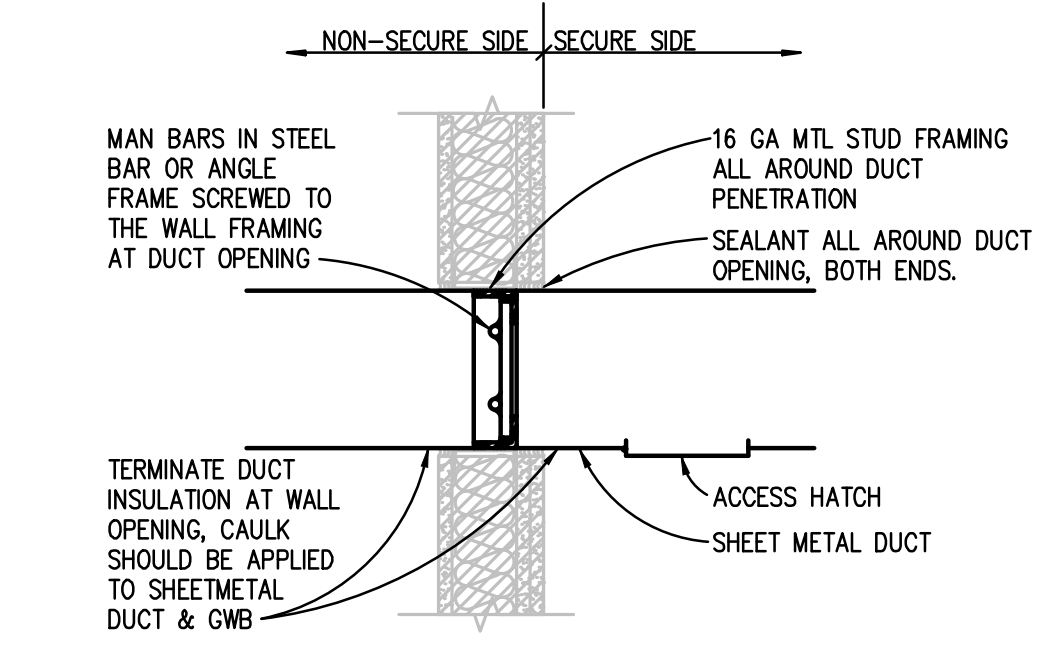
TYPICAL SPRINKLER PIPING DETAIL
NO SCALE

TRAP DIMENSION TABLE										
TYPE OF SYSTEM	S.P. AT DRAIN PAN (N.) (NOTE A)	DIMENSION "A" (INCHES) MIN.	DIMENSION "B" (INCHES)	DIMENSION "C" (INCHES) (TRAP SEAL)	DIMENSION "D" (INCHES)	DIMENSION "E" (INCHES)	DIMENSION "F" (INCHES) (+/-)			
							DRAIN PIPE SIZE (INCHES)			
							1 TO 1-1/2	2	2 1/2, 3	4
DRAW THROUGH	-2.1 TO -3	3.5	3.5	2	3	2	8.0-8.5	9.0	9.5-10.0	11.0
	UP TO -2	3.0	3.0	2	2	2	7.0-7.5	8.0	8.5-9.0	10.0
BLOW THROUGH	UP TO +2	4.0	2.0	2	2	4	7.0-7.5	8.0	8.5-9.0	10.0
	+2.1 TO +3	5.0	2.0	2	3	5	8.0-8.5	9.0	9.5-10.0	11.0

NOTES:
 A. REFER TO EQUIPMENT SCHEDULES FOR (-) OR (+) STATIC PRESSURE AT DRAIN PAN.
 A. BASE TRAP DIMENSIONS ON ____" S.P. FOR DRAW THROUGH UNITS AND ____" S.P. FOR BLOW THROUGH UNITS.
 B. DRAIN PIPE SIZE SHALL BE SIZE OF DRAIN PAN OUTLET, MINIMUM 1".
 C. DIMENSION "C" IS MIN: 3" FOR UP TO 1 1/2" DRAIN PIPE
 4" FOR 2" DRAIN PIPE
 5" FOR 2 1/2" OR 3" DRAIN PIPE
 6" FOR 4" DRAIN PIPE

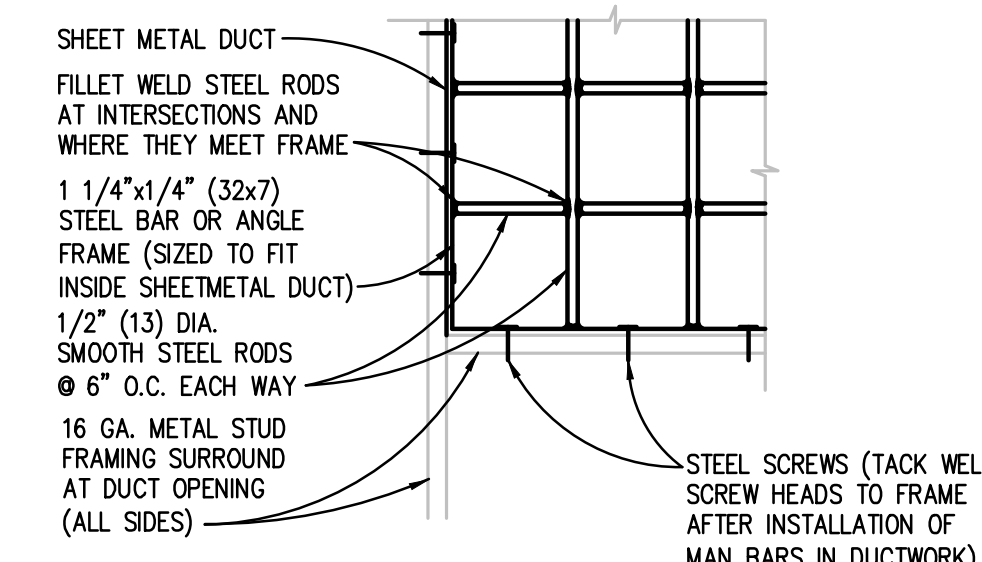


CONDENSATE DRAIN PAN TRAP DETAIL (UNITARY UNITS NOT ABOVE CEILING)
NO SCALE



NOTE: DUCTS OVER 96 SQUARE INCHES THAT PENETRATE THE PERIMETER WALL MUST HAVE 1/2" MAN BARS INSTALLED AT THE POINT OF ENTRY. MAN BARS SHALL BE SPACED AND WELDED AT 6" O.C. EACH WAY (SEE MAN BAR DETAIL). DUCTS WITH ANY DIMENSIONS LESS THAN 6" DO NOT REQUIRE MAN BARS. A 12"x12" INSPECTION PORT AND ACCESS HATCH MUST BE INSTALLED ON THE SECURE SIDE OF THE PARTITION. ENSURE ACCESS HATCH OPENS A MINIMUM OF 90 DEGREES AND IS NOT OBSTRUCTED. COORDINATE LOCATION WITH CEILING GRID, LIGHTS, PIPES, CONDUITS, AND OTHER DUCTS, ETC.

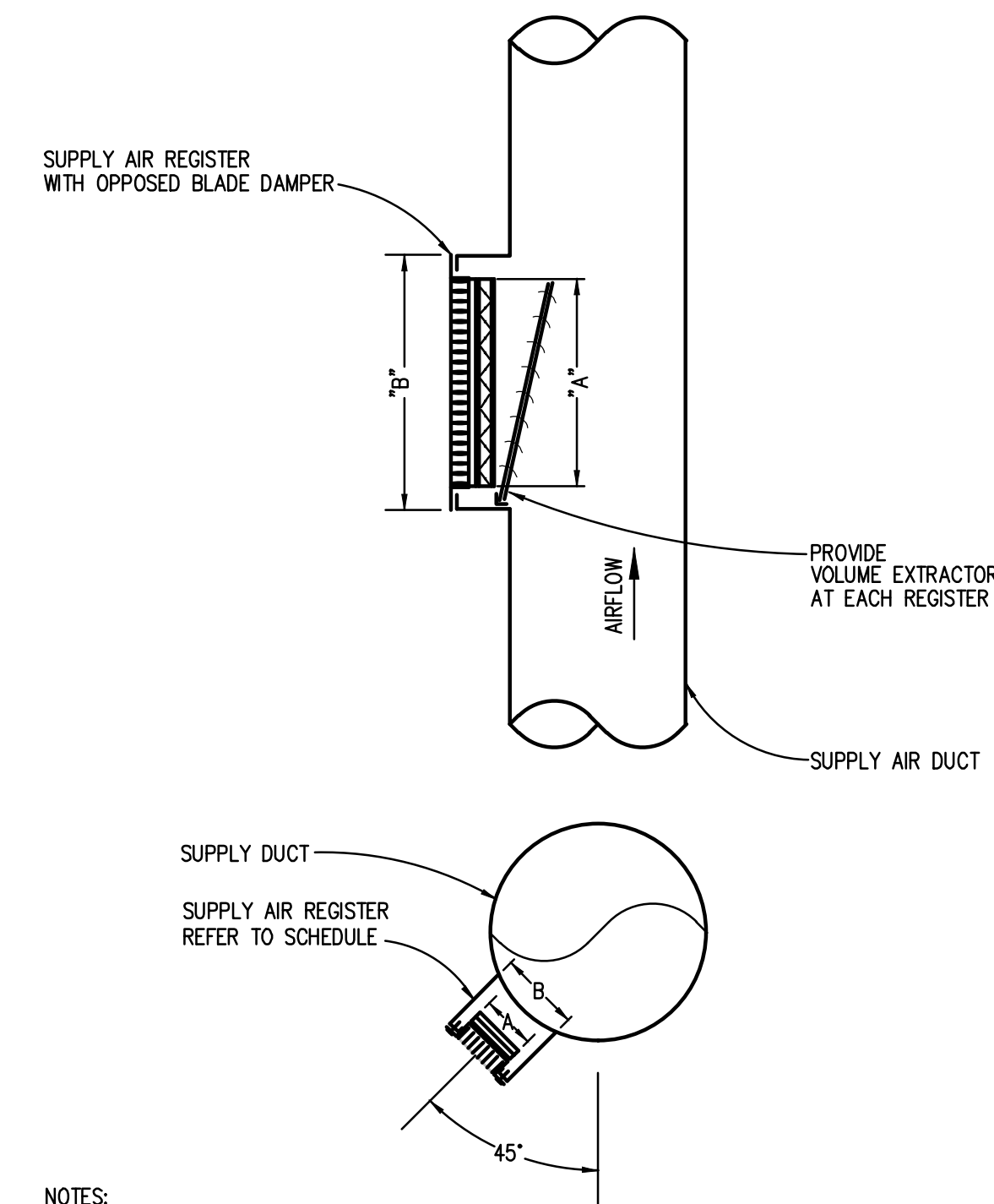
SUPPLY/RETURN/RELIEF AIR DUCT PENETRATION
NO SCALE



NOTE: 1. MAN BARS IN STEEL BAR OR ANGLE FRAME SCREWED TO THE WALL FRAMING AT DUCT OPENING.

MAN BARS REQUIRED FOR DUCT OPENINGS GREATER THAN 96 SQ INCHES, UNLESS ONE DIMENSION IS LESS THAN 6 INCHES.
 2. IF CODE REQUIRES THE INSTALLATION OF A FIRE DAMPER, INTEGRITY OF MAN BARS SHALL BE MAINTAINED.

HVAC DUCT MANBAR ELEVATION
NO SCALE



NOTES:
 1. A = GRILLE/REGISTER THROAT SIZE
 2. B = OVERALL FRAME SIZE

DUCT MOUNTED SUPPLY AIR REGISTER DETAIL
NO SCALE



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DRAWING NUMBER	M-604
	MECHANICAL DETAILS
DRAWING TITLE	MECHANICAL DETAILS
SHEET NUMBER	76 OF 96
ISSUED FOR	CONSTRUCTION DOCUMENTS
DATE	04/01/2022
DRAWN	RLT
CHECKED	DAC
APPROVED	DAC
DESIGNED	RLT
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: 121456 FILE NO. 511/21326.CAK DWG PROJECT NO. 2483802016	
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DUCT SYSTEM INSULATION APPLICATION SCHEDULE									
	INSULATION MATERIAL & THICKNESS (INCHES)								FIELD APPLIED JACKET MATERIAL
	FIBERGLASS BLANKET 0.75 LB/CU FT	FIBERGLASS BLANKET 1.0 LB/CU FT	FIBERGLASS BOARD 2.25 LB/CU FT	FIBERGLASS BOARD 6.0 LB/CU FT	FLEXIBLE ELASTOMERIC	ASTM E2336 2-HOUR FIRE RATED BLANKET	2-HOUR FIRE RATED BLANKET	ALUMINUM	

DUCT SYSTEMS LOCATED INDOORS										
SUPPLY AIR, EXCEPT AS NOTED BELOW	1.5									A, B
OUTSIDE AIR AND MIXED AIR, EXCEPT AS NOTED BELOW	1.5									
OUTSIDE AIR INTAKE, RELIEF AIR AND EXHAUST AIR PLENUMS ADJACENT TO EXTERIOR LOUVERS		1.5								
EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, EXCEPT AS NOTED BELOW	1.5									
RECTANGULAR EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS		1.5								
ROUND & FLAT OVAL EXHAUST AND RELIEF AIR BETWEEN ISOLATION DAMPER AND PENETRATION OF BUILDING EXTERIOR, IN MECHANICAL ROOMS	1.5									
LOCKER ROOM AND WET AREA EXHAUST BETWEEN EXHAUST GRILLE & CONNECTION TO GENERAL EXHAUST OR BETWEEN EXHAUST GRILLE AND PENETRATION OF BUILDING EXTERIOR	1.5									

PLENUMS, DUCTS, AND DUCT ACCESSORIES NOT REQUIRING INSULATION:
 FIBROUS-GLASS DUCTS
 DOUBLE-WALL METAL DUCTS WITH INSULATION OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/ESNA 90.1 - 2013
 METAL DUCTS WITH DUCT LINER OF SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/ESNA 90.1 - 2013
 FABRIC SUPPLY DUCTS
 FACTORY-INSULATED FLEXIBLE DUCTS
 FACTORY-INSULATED PLENUMS AND CASINGS
 FLEXIBLE CONNECTORS
 VIBRATION-CONTROL DEVICES
 FACTORY-INSULATED ACCESS PANELS AND DOORS

- GENERAL NOTES**
- 'X' OR THICKNESS IN INCHES INDICATE ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A DUCT SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
 - REFER TO METAL DUCT SECTION OF SPECIFICATIONS FOR DUCT LINING AND DOUBLE-WALL INSULATED DUCT.
 - REFER TO HVAC CASINGS SECTION OF SPECIFICATIONS FOR DOUBLE-WALL INSULATED PLENUMS.

KEYED NOTES

A. INCLUDE INSULATION AROUND DUCT MOUNTED COILS AND AIR TERMINAL UNIT COILS.
 B. EXPOSED SUPPLY DUCTWORK LOCATED IN CONDITIONED SPACE SERVED BY THAT SYSTEM IS NOT REQUIRED TO BE INSULATED.

ABOVEGROUND HVAC PIPE & ACCESSORY INSULATION APPLICATION SCHEDULE												
	INSULATION MATERIAL & THICKNESS (INCHES)						FIELD-APPLIED JACKET MATERIAL					
	FLEXIBLE ELASTOMERIC	FIBERGLASS	MINERAL WOOL	POLYISOCYANURATE	PHENOLIC	CELLULAR GLASS	CALCIUM SILICATE	ALUMINUM	STAINLESS STEEL	PVC	SELF-ADHESIVE (FOR OUTDOOR APPLICATIONS)	PVDC (INDOOR)

INDOOR PIPE SYSTEM AND SIZE (INCHES)														
HEATING HOT WATER SUPPLY & RETURN 200 DEG F AND LOWER														
NPS 1-1/4 AND SMALLER														
			1.5							X	X			A
NPS 1-1/2 AND LARGER														
			2							X	X			A
REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)														
	1									X	X			

OUTDOOR (ABOVEGROUND) AND TUNNEL PIPE SYSTEM AND SIZE (INCHES)

REFRIGERANT SUCTION & HOT GAS (SOFT COPPER)														
	2													B

- UNLESS OTHERWISE INDICATED OR SCHEDULED, THE FOLLOWING DO NOT REQUIRE INSULATION:
 DIRECT BURIED COOLING SYSTEM PIPING
 PIPING THAT CONVEYS FLUIDS HAVING DESIGN OPERATING TEMPERATURE RANGE BETWEEN 60 DEG F. AND 105 DEG F., INCLUSIVE.
- GENERAL NOTES**
- 'X' OR THICKNESS IN INCHES INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
 - INSULATE PIPING WITHIN AIR HANDLING EQUIPMENT THE SAME AS INDOOR PIPING. PROVIDE ALUMINUM OR STAINLESS STEEL JACKET.
 - FOR PIPING NPS 1-1/4 AND SMALLER WITHIN PARTITIONS IN CONDITIONED SPACES INSULATION MAY BE REDUCED BY ONE-INCH THICKNESS, BUT NOT TO LESS THAN ONE-INCH THICKNESS.
 - FOR PIPING NPS 1 AND SMALLER, INSULATION IS NOT REQUIRED FOR STRAINERS, CONTROL VALVES, AND BALANCING VALVES.

- KEYED NOTES**
- A. PROVIDE FIELD APPLIED JACKET FOR PIPING EXPOSED IN EQUIPMENT ROOMS, STORAGE ROOMS, JANITORS CLOSETS, RECEIVING ROOMS, TEST AREAS, CIRCULATION AREAS AND SUCH AREAS SUBJECT TO DAMAGE WITHIN 10 FEET (3 METERS) OF FINISHED FLOOR.
 B. PROVIDE MANUFACTURER'S RECOMMENDED PROTECTIVE COATING FOR FLEXIBLE ELASTOMERIC THERMAL INSULATION.

ABOVEGROUND HVAC PIPING & VALVE APPLICATION SCHEDULE																		
PIPE SIZE (INCHES)	MATERIAL					CONNECTION				ISOLATION VALVES		KEYED NOTES						
	SOFT COPPER TYPE K	HARD COPPER TYPE L	HARD COPPER TYPE M	CARBON STEEL (SCHED. 40)	CARBON STEEL (SCHED. 80)	CARBON STEEL (STD.)	COPPER TYPE DWV	SOLDERED	BRAZED	WELDED	THREADED		FLANGED	GROOVED	PRESSURE SEAL	MECHANICALLY FORMED TEE	BALL	GENERAL SERVICE BUTTERFLY

HEATING HOT WATER SUPPLY & RETURN - MIN. WORKING PRESS. & TEMP. - 125 PSIG AT 200 DEG F

UP TO 2				X							X					X				
UP TO 2	X						X	X						X		X				

- GENERAL NOTES**
- 'X' INDICATES ACCEPTABLE SELECTION. IF MORE THAN ONE SELECTION IS INDICATED FOR A PIPING SYSTEM, CONTRACTOR MAY SELECT FROM THOSE INDICATED SELECTIONS.
 - DISSIMILAR-METAL PIPING JOINTS: CONSTRUCT JOINTS USING DIELECTRIC FITTINGS COMPATIBLE WITH BOTH PIPING MATERIALS. IF A BRONZE VALVE CONNECTS THE DISSIMILAR METALS NO FURTHER DIELECTRIC ISOLATION IS REQUIRED.
 - NPS 2 AND SMALLER: USE BRASS COUPLING, NIPPLE, OR UNION.
 - NPS 2-1/2 AND LARGER: USE DIELECTRIC FLANGE KITS.
 - USE UNIONS OR FLANGES AT VALVE AND EQUIPMENT CONNECTIONS.
 - HVAC EQUIPMENT DRAINS, VENTS, SAFETY VALVE PIPING, BLOWDOWN PIPING AND THE LIKE SHALL BE SAME PIPING MATERIAL AS ASSOCIATED PIPING SYSTEM.
 - GROOVED END VALVES MAY BE USED WITH GROOVED PIPING.



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FORBES
 Financial Administration

PROJECT: RENOVAITE ARMORY WASHTEAW ARMORY

DESIGNED: RLT

DATE: 04/01/2022

ISSUED FOR: CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER: PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: 121465 FILE NO. 511/21326.CAK DWG PROJECT NO. 2483822016

SHEET NUMBER: 78 OF 96

DRAWING TITLE: MECHANICAL SCHEDULES

DRAWING NUMBER: **M-702**

BLOWER COIL UNIT SCHEDULE

UNIT IDENTIFICATION	FAN						COOLING COIL - DX										HEATING COIL - HOT WATER										ARRANGEMENT	MAXIMUM UNIT DIMENSIONS			UNIT WEIGHT (LBS.)	FILTER TYPE	MODULATION/CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES
	AIRFLOW CFM	MINIMUM OA CFM	ESP IN. W.G.	TSP IN. W.G.	BHP	HP	FAN RPM	SENSIBLE CAPACITY MBH	TOTAL CAPACITY MBH	AIR		MAX A.P.D. IN. WG.	NUMBER OF CIRCUITS	REFRIG. TYPE	MAX FACE VEL. F.P.M.	COIL F.P.I./ROWS	MINIMUM TOTAL CAPACITY MBH	WATER					LENGTH INCHES	WIDTH INCHES	HEIGHT INCHES	VOLTS		PHASE	FLA	MOP				SCCR KA	OPTIONS/ACCESSORIES					
										E.A.T. F	L.A.T. F							E.D.B. F	L.D.B. F	FLOW GPM	E.W.T. F	L.W.T. F														MAX FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD			
BCU-1	1050	275	0.5	1.05	-	1	1346	22.8	38.8	80.8/68.0	56.6/56.1	0.25	2	R-410A	500	10/3	45.3	53.1	90	3.0	180	140	2.0	10	HORIZONTAL	58	36	24	375	MERV 8	ECM	208	3	4.6	15	5	B	HDD-12	1, 2	
BCU-2	1450	350	0.5	1.05	-	1	1070	---	---	---	---	---	---	---	---	56.4	54.6	90	2.8	180	140	5	15	HORIZONTAL	58	44	24	400	MERV 8	ECM	208	1	11.8	20	5	B	HDD-16	2		

GENERAL NOTES:
 1. REFER TO SCHEDULES GENERAL NOTES.
 2. MODEL NUMBERS ARE ENVIRO-TEC UNLESS OTHERWISE NOTED

KEYED NOTES:
 1. AIR-SIDE ECONOMIZING CONTROL SHALL BE PROVIDED FOR UNIT.
 2. PROVIDE MIXING BOX AND BASE RAIL.

SCHEDULES GENERAL NOTES:

- TYPICAL FOR ALL SCHEDULE SHEETS:
- REFER TO ELECTRICAL STANDARD SCHEDULES, ONE LINE DIAGRAM AND PANEL SCHEDULES FOR ADDITIONAL ELECTRICAL INFORMATION
 - PROVIDE THE FOLLOWING FACTORY-WIRED ELECTRICAL OPTIONS/ACCESSORIES WHERE INDICATED IN SCHEDULE:
 - A - NON-FUSED DISCONNECT SWITCH
 - B - UNIT SHALL BE SINGLE POINT ELECTRICAL CONNECTION WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS
 - C - SERVICE RECEPTACLE
 - D - FUSED DISCONNECT SWITCH
 - E - COMBINATION STARTER
 - F - UNIT SHALL HAVE (2) SINGLE POINT CONNECTIONS WITH FACTORY INSTALLED DISCONNECTING MEANS AND ALL REQUIRED STARTERS AND CONTROLS. (1) CONNECTION SHALL BE FOR CONDENSING SECTION AND (1) CONNECTION SHALL BE FOR THE REMAINDER OF THE UNIT.
 - FOR MODULATION/CONTROL TYPE COLUMN, "VFC" INDICATES VARIABLE FREQUENCY CONTROLLERS, "AUTO" INDICATES AUTOMATIC OPERATION (CONTROLLED BY TEMPERATURE CONTROLS OR SELF CONTAINED CONTROLS), "MANUAL" INDICATES HAND OPERATION.
 - IF VARIABLE FREQUENCY CONTROLLERS ARE INDICATED TO BE PROVIDED AND ARE NOT INSTALLED INTEGRAL TO THE UNIT, VARIABLE FREQUENCY CONTROLLERS SHALL BE SUPPLIED BY THE MECHANICAL CONTRACTOR (UNLESS OTHERWISE NOTED) AND INSTALLED BY THE ELECTRICAL CONTRACTOR INCLUDING THE LINE SIDE AND LOAD SIDE WIRING TO THE MOTOR AND INCLUDING MISCELLANEOUS STEEL REQUIRED FOR THE SUPPORT AND MOUNTING OF THE VFC. REFER TO FLOOR PLANS FOR LOCATION.
 - WHERE EQUIPMENT IS INDICATED TO HAVE A SINGLE POINT ELECTRICAL CONNECTION, THAT EQUIPMENT SHALL COME COMPLETE WITH FACTORY INSTALLED STARTERS, MOTOR OVERLOAD PROTECTION, CONTACTORS, FUSING AND ALL NECESSARY INTERNAL WIRING AND CONTROLS. PROVIDE A FACTORY MOUNTED UNIT DISCONNECTING MEANS WHERE THE ELECTRICAL CONTRACTOR SHALL MAKE SINGLE POINT CONNECTION. INSTALL PACKAGED EQUIPMENT SUCH THAT THE ELECTRICAL CONNECTION AND CONTROLS ARE ACCESSIBLE AND HAVE CLEARANCES MEETING THE NATIONAL ELECTRICAL CODE.
 - WHERE PACKAGED EQUIPMENT IS PROVIDED, NAMEPLATE MUST INDICATE MAXIMUM OVERCURRENT PROTECTION BY HACR RATED CIRCUIT BREAKERS OR FUSES. IF FUSE PROTECTION ONLY IS INDICATED, PROVIDE A FUSIBLE DISCONNECT AND FUSES WITH THE UNIT.
 - WHERE EQUIPMENT IS DESIGNATED BY MANUFACTURER AND MODEL NUMBER, THIS IS THE BASIS OF DESIGN. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT BY OTHER SPECIFIED MANUFACTURERS OR PROPOSED ALTERNATE EQUIPMENT BY THE BASIS OF DESIGN MANUFACTURER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REVISIONS TO ELECTRICAL REQUIREMENTS, STRUCTURAL LOADING, OR ARCHITECTURAL APPURTENANCES AND SHALL INCLUDE THE COST OF SUCH REVISIONS IN HIS BID.
 - WHERE EQUIPMENT IS SCHEDULED TO INCLUDE A SERVICE RECEPTACLE, PROVIDE A FACTORY MOUNTED SERVICE RECEPTACLE WITH APPROPRIATE FUSES AND TRANSFORMERS CONNECTED ON THE LINE SIDE OF THE UNIT DISCONNECT. PROVIDE A NAMEPLATE ON THE DISCONNECT SWITCH INDICATING THE PRESENCE OF LIVE POWER TO THE SERVICE RECEPTACLE WHEN THE UNIT DISCONNECT IS IN THE OFF POSITION.
 - SIZE ALL EQUIPMENT FEEDERS BASED ON THE LISTED MOP (MAXIMUM OVERCURRENT PROTECTION). REFER TO THE FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE ON THE ELECTRICAL STANDARD SCHEDULES SHEET.

AIR-COOLED CONDENSING UNIT SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TOTAL CAPACITY MBH	MINIMUM EER	REFRIGERATION TYPE	NUMBER OF CIRCUITS	NUMBER OF CONTROL STAGES	CONDENSER		SUCTION TEMPERATURE F	CONDENSER FAN		COMPRESSOR TYPE OF COMPRESSOR	UNIT WEIGHT W/ CURB (LBS.)	MODULATION/CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES		
							DESIGN AMBIENT TEMPERATURE F	MINIMUM AMBIENT TEMPERATURE F		QUANTITY	HP EACH				VOLTS	PHASE	MCA	MOP	SCCR KA			OPTIONS/ACCESSORIES	
ACCU-2	BCU-1	37.9	11	R-410A	1	1	95	0	43	1	1/5	1	SCROLL	300	AUTO	208	3	18	30	5	A	24ABB3	1

GENERAL NOTES:
 1. REFER TO SCHEDULES GENERAL NOTES.
 2. MODEL NUMBERS ARE CARRIER UNLESS OTHERWISE NOTED.
 3. REFER TO BLOWER COIL UNIT DIRECT EXPANSION COOLING COIL SCHEDULE FOR ASSOCIATED COOLING COIL.
 4. EFFICIENCY RATING SHALL BE IN ACCORDANCE WITH ARI-STANDARD 340/360-2004.

KEYED NOTES:
 1. UNIT SHALL OPERATE DOWN TO 0F.

HOT WATER CABINET UNIT HEATER SCHEDULE

UNIT IDENTIFICATION	CAPACITY MBH	AIR			FAN		WATER			CONTROL VALVE W.P.D. FT. HEAD	DIMENSIONS			RECESS DEPTH INCHES	FILTER TYPE	MODULATION/CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES		
		AIRFLOW CFM	E.D.B. F	L.D.B. F	HP	RPM	FLOW GPM	FLUID TYPE	E.W.T. F		L.W.T. F	MAXIMUM W.P.D. FT. HEAD	LENGTH INCHES				HEIGHT INCHES	DEPTH INCHES	VOLTS	PHASE	SCCR KA			OPTIONS/ACCESSORIES	
CUH-7	12.1	360	40	90	0.05	-	0.6	WATER	180	140	0.5	1.2	48-3/4	25	9-3/4	-	PERMANENT	1.8	AUTO	120	1	5	B	C-004	1

GENERAL NOTES:
 1. REFER TO SCHEDULES GENERAL NOTES.
 2. MODEL NUMBERS ARE MODINE UNLESS OTHERWISE NOTED.

KEYED NOTES:
 1. PROVIDE ARRANGEMENT 06.

POWER VENTILATOR SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	TYPE	AIRFLOW CFM	T.S.P. IN. W.G.	TIP SPEED FPM	FAN RPM	MOTOR				CURB HEIGHT INCHES	MODULATION/CONTROL TYPE	ELECTRICAL				MAXIMUM SOUND POWER LEVELS								MODEL NUMBER	KEYED NOTES
							BHP	HP	RPM	DRIVE TYPE			VOLTS	PHASE	SCCR KA (NOTE 3)	OPTIONS/ACCESSORIES	UNIT DISCHARGE/INLET Lw BY OCTAVE BAND									
							63 HZ (DB)	125 HZ (DB)	250 HZ (DB)	500 HZ (DB)			1000 HZ (DB)	2000 HZ (DB)	4000 HZ (DB)	8000 HZ (DB)										
VF-3	VAULT	INLINE, CENTRIFUGAL	200	0.5	4536	1549	0.12	1/4	1725	DIRECT	---	ECM	120	1	5	-	80/79	85/83	68/74	67/73	58/63	53/59	52/58	48/52	SQ-97-VG	
EF-12	RESTROOMS	ROOF, CENTRIFUGAL	400	0.5	3677	1255	0.1	1/6	1725	BELT	18	AUTO	120	1	5	-	-/71	-/69	-/68	-/60	-/56	-/52	-/45	-/41	GB-098-6	

GENERAL NOTES:
 1. REFER TO SCHEDULES GENERAL NOTES.
 2. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
 3. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

INDOOR UNIT														OUTDOOR UNIT														MODEL NUMBER	KEYED NOTES								
UNIT IDENTIFICATION	TOTAL COOLING CAPACITY MBH	TOTAL HEATING CAPACITY MBH	EVAPORATOR FAN			COOLING COIL		HEATING COIL		FILTER	ELECTRICAL					MAXIMUM UNIT OPERATING WEIGHT LBS. (WITH CURB)	MODEL NUMBER	UNIT IDENTIFICATION	CONDENSING SECTION					MODULATION/CONTROL TYPE	ELECTRICAL					MAXIMUM UNIT OPERATING WEIGHT LBS. (WITH CURB)	MODEL NUMBER						
			MAX AIRFLOW CFM	NUMBER FANS	WATTS EACH	E.D.B. F	E.W.B. F	E.A.T. F	L.A.T. F		EFF. %	VOLTS	PHASE	FLA	MOP				SCCR KA	NUMBER OF COMPRESSORS	NUMBER OF CONTROL STAGES	AMBIENT TEMPERATURE F	AIRFLOW CFM		FAN WATTS	VOLTS	PHASE					MCA	MOP	SCCR KA			
ACU-6	12.4	15.5	335	1	-	80	67	70	60	MERV 3	KEYED NOTE #1					5	50	LCN0128HV4	ACCU-6	1	MODULATING					95/0	988	-	AUTO	208	1	12.3	15	5	200	LUU12HV	1,2

GENERAL NOTES:
 1. REFER TO SCHEDULES GENERAL NOTES.
 2. MODEL NUMBERS LG UNLESS OTHERWISE NOTED.

KEYED NOTES:
 1. INDOOR UNIT POWER FEED THROUGH OUTDOOR UNIT.
 2. UNITS SHALL BE CAPABLE OF OPERATING DOWN TO 0 DEG. F.
 3. PROVIDE DEHUMIDIFICATION.

PUMP SCHEDULE

UNIT IDENTIFICATION	SYSTEM SERVED	LOCATION	TYPE	COUPLING TYPE	WATERFLOW GPM	FLUID TYPE	COLDEST SYSTEM OPERATING TEMP. F FOR PUMP SELECTION	PUMP HEAD FT.	OVERLOAD GPM	MINIMUM EFFICIENCY %	MOTOR			MODULATION/CONTROL TYPE	ELECTRICAL					MODEL NUMBER	KEYED NOTES
											BHP	HP	RPM		VOLTS	PHASE	SCCR KA (NOTE 3)	OPTIONS/ACCESSORIES			
CP-5	BCU-2	PES	INLINE	CLOSE	3.6	WATER	40	15	NON-OVERLOADING	---	---	1/6	3300	AUTO	120	1	5	---	PL-36		

GENERAL NOTES:
 1. REFER TO SCHEDULES GENERAL NOTES.
 2. MODEL NUMBER ARE BELL & GOSSETT UNLESS OTHERWISE NOTED.
 3. CONTROLLER (E.G. VARIABLE FREQUENCY CONTROLLER, MOTOR STARTER) FOR SPECIFIED EQUIPMENT SHALL BE MANUFACTURED AND MARKED PER NEC WITH A MINIMUM SHORT CIRCUIT CURRENT RATING AS INDICATED.

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FORBES
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PROJECT: RENOVATE ARMORY WASHTEWAW ARMORY

DESIGNED: RLT
 DRAWN: CHECKED: DAC
 APPROVED: DAC

DATE: 04/01/2022

ISSUED FOR: CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER: PROJECT: WASHTEWAW ARMORY
 CONTRACT NUMBER: Y2146
 FILE NO. 511/21326.CAK
 DWG PROJECT NO. 263802016

SHEET NUMBER: 79 OF 96

DRAWING TITLE: MECHANICAL SCHEDULES

DRAWING NUMBER: **M-703**

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9:\2021\2021-0363-00\CAD\2021-0363-M7-SH.dwg, M-704, 3/25/2022 2:16:23 PM, Devin J. Senechal, Peter Basso Associates Inc.

COMBINATION BALANCE VALVE AND FLOW MEASURING DEVICE SCHEDULE									
MANUFACTURER	VALVE SIZE	FLOW RANGE		DIFFERENTIAL PRESSURE READING AT PRESSURE TAPS		VALVE PERMANENT PRESSURE LOSS (VALVE FULL OPEN)		MODEL NUMBER	KEYED NOTES
		GPM		INCHES W.G.		FT. HEAD			
		MINIMUM	MAXIMUM	AT MINIMUM GPM	AT MAXIMUM GPM	AT MINIMUM GPM	AT MAXIMUM GPM		
FLOW DESIGN ACCUSETTER	1/2	0.4	0.9	22	109	0.7	3.8	UA	
	3/4	0.9	2.4	23	148	0.5	2.9	UA	
	3/4	2.2	3.4	26	62	0.5	1.2	UA	
	1	3.4	6.6	40	150	0.8	2.8	UA	
	1 1/4	5.6	12	23	105	0.2	1.1	UA	
	1 1/2	9.5	20	22	95	0.6	2.7	UA	
	2	20	44	21	99	0.2	1	UA	
	2 1/2	40	80	25	77	0.2	0.6	250L	
	3	60	130	14	64	0.1	0.5	300L	
PRO HYDRONIC SPECIALTIES	4	120	260	16	75	0.2	0.8	400L	
	3/4	0.3	2.5	7	147	0.1	1.3	CBV075UL	
	1	2.5	5.5	10	145	0.1	1.2	CBV100	
	1 1/4	5.5	9	10	145	0.1	1.2	CBV125	
	1 1/2	9	16.5	11	147	0.1	1.3	CBV150	
	2	16.5	34.5	10	146	0.1	1.3	CBV200	
	2 1/2	35	57	12.5	139	0.1	1.2	CBVF250L	
	3	57	100	5.2	149	0.1	1.3	CBVF300L	
	4	100	220	5.1	147	0.1	1.3	CBVF400L	
NEXUS	1/2	0.4	1.5	2.6	36	0.2	2.3	XB	
	3/4	1.5	3.4	5.1	26	0.3	1.7	XB	
HCI	1	2.9	7	4.3	25	0.1	0.7	XB	
	1/2	0.5	0.5	5.4	8.1	0.3	0.4	TB-B VEN-4	
	3/4	0.5	1.5	3.2	26.7	0.1	0.7	TB-B VEN-6	
	3/4	1.5	2	8.8	16.3	0.4	0.7	TB-B VEN-7.5	
	1	2	3.9	5.3	20.8	0.2	0.7	TB-C VEN-10	
	1	3.9	5.5	5	10	0.2	0.3	TB-C VEN-14.5	
	1 1/4	5.5	17	2.7	25.3	0.1	0.6	TB-D VEN-19	
	2	17	31.4	8.9	30.4	0.3	0.7	TB-F VEN-25	
	2 1/2	31	57	17	57.5	0.1	0.3	TB-G LOW B-1.234	
	3	57	100	24.2	74.3	0.2	0.4	TB-H LOW B-1.533	
GRISWOLD	4	100	220	4.6	21.9	0.1	0.2	TB-I B-3.015	
	3/4L	0.4	0.8	5	32	0.1	2.4	QS2 (CV 0.8)	
	3/4L	0.7	1.9	5	45	0.1	2.9	QS2 (CV 1.7)	
	3/4L	1.3	3.8	5.2	45	0.1	2.8	QS2 (CV 3.5)	
	3/4L	2.6	8.4	5.2	54	0.1	2.9	QS2 (CV 7.5)	
	1	1.3	3.6	5.2	40	0.1	2.8	QS3 (CV 3.3)	
	1	2.6	6.6	5.2	34	0.1	2.1	QS3 (CV 7.0)	
	1	4.1	12.3	5.2	47	0.1	2.8	QS3 (CV 11.35)	
	1 1/4	3.4	6.9	5	19	0.1	1.4	QS4 (CV 9.0)	
	1 1/4	6.8	20	5	43	0.1	2.4	QS4 (CV 19.8)	
	1 1/2	6.8	20	5	43	0.1	2.6	QSS (CV 19.2)	
	1 1/2	12.3	23	5	17	0.1	1	QSS (CV 36)	
	1 1/2	12.3	29	5	28	0.1	0.8	QSS (CV 45)	
	2	20.3	40	5	19	0.1	1	QS6 (CV 61)	
	2	20.3	44	5	23	0.1	0.8	QS6 (CV 75)	
	2 1/2	39	68	20	61	0.1	0.6	3QFM (CV 135)	
3	66	117	20	40	0.1	0.8	3QFN (CV 201)		
4	116	230	20	78	0.1	0.7	3QFP (CV 417)		
VCTAULIC	1/2	0.1	0.5	12	240	0.1	1.5	S/786	
	3/4	0.5	2.5	12	240	0.3	1.4	S/786	
	1	2.5	5.5	12	240	0.7	1.4	S/786	
	1 1/4	5.5	9	12	240	0.5	1.4	S/786	
	1 1/2	9	16.5	12	240	0.8	1.4	S/786	
	2	16.5	34.5	12	240	0.5	1.3	S/786	
	2 1/2	35	57	12	240	0.2	1.3	S/788	
	3	57	100	12	240	0.7	1.3	S/788	
4	100	220	12	240	0.5	1.4	S/788		

GENERAL NOTES:
 1. SELECTED VALVE SHALL MATCH PIPE SIZE UNLESS REQUIRED FLOW RATE IS BELOW THE FLOW RANGE FOR THAT SIZE VALVE. PROVIDE REDUCERS AS REQUIRED IF VALVE SIZE IS LESS THAN PIPE SIZE.
 2. VALVE FLOW RANGES AND PRESSURE DROPS BASED ON WATER.

AIR TERMINAL TYPE											
DUCT CONNECTIONS		DISCHARGE SOUND POWER/RADIATED SOUND POWER - dB						DIMENSIONS		MODEL NUMBER	KEYED NOTES
INLET SIZE INCHES	OUTLET SIZE INCHES	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	LENGTH INCHES	HEIGHT INCHES		
8ø	12x10	72/68	70/59	66/53	63/47	57/46	53/46	25-1/8	10	SDV5	1

GENERAL NOTES:
 1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.
 2. MAXIMUM SOUND POWER LEVEL BASED ON 2" PRESSURE DROP ACROSS UNIT WITH NO ALLOWANCE FOR EXTERNAL ATTENUATION.

KEYED NOTES:
 1. BASED ON 650 CFM

AIR TERMINAL UNIT WITH HOT WATER COIL SCHEDULE																			
UNIT IDENTIFICATION	INLET SIZE	AREA SERVED	UNIT SERVED FROM	AIR FLOW					HEATING COIL (NOTE 3)									KEYED NOTES	
				COOLING MAX CFM	COOLING MIN. CFM	HEATING MIN. CFM	HEATING MAX CFM	MAXIMUM A.P.D. W/COIL IN. W.G.	CAPACITY MBH	NUMBER ROWS	AIR			WATER					
											E.D.B. F	L.D.B. F	FLOW GPM	E.W.T. F	L.W.T. F	MAXIMUM W.P.D. FT. HEAD	CONTROL VALVE W.P.D. FT. HEAD		CONTROL VALVE TYPE
VAV-111	8ø	RESTROOMS	(E)AHU	400	400	400	400	0.25	13.0	1	55	85	1.6	180	163.5	5	15	2-WAY	

GENERAL NOTES:
 1. MODEL NUMBERS ARE PRICE UNLESS OTHERWISE NOTED.
 2. MAXIMUM PRESSURE DROP SCHEDULED SHALL BE THE MAXIMUM ALLOWABLE STATIC PRESSURE FOR BOX AND COIL. AT THE MAXIMUM CFM.
 3. HEATING COIL SELECTION BASED ON HEATING MAXIMUM AIR FLOW.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE									
UNIT IDENTIFICATION	TYPE	FACE SIZE	NECK SIZE	FRAME TYPE	ACCESSORY	CONSTRUCTION	FINISH	MODEL NUMBER	KEYED NOTES
S-1	REGISTER	NK + 1 3/4	SEE PLANS	NOTE 2	AIR SCOOP DAMPER	ALUMINUM	WHITE	S300FL	ANGLE BLADES TO 0 DEGREES
S-2	DIFFUSER	24x24	SEE PLANS	NOTE 2	---	STEEL	WHITE	OMNI-AA	
S-3	DIFFUSER	12x12	SEE PLANS	NOTE 2	---	STEEL	WHITE	OMNI-AA	
R-1	GRILLE	NK + 2	SEE PLANS	NOTE 2	---	ALUMINUM	WHITE	SG-PRA	
E-1	GRILLE	12x12	SEE PLANS	NOTE 2	OPPOSED BLADE DAMPER	ALUMINUM	WHITE	PAR-AA	
E-2	GRILLE	24x24	SEE PLANS	NOTE 2	OPPOSED BLADE DAMPER	ALUMINUM	WHITE	PAR-AA	

GENERAL NOTES:
 1. MODEL NUMBERS ARE TITUS UNLESS OTHERWISE NOTED.

INTAKE HOOD SCHEDULE													
UNIT IDENTIFICATION	SYSTEM SERVED	CFM	THROAT SIZE INCHES	HOOD INTAKE VELOCITY FPM	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	HOOD SIZE			CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
							WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES				
IH-1	BCU-1	1050	26x12	315	485	0.04	40	26	14-3/4	18	ALUMINUM	WH	
IH-2	BCU-2	350	12x12	155	350	0.02	26	26	14-3/4	18	ALUMINUM	WH	

GENERAL NOTES:
 1. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
 2. PROVIDE WITH BIRD SCREEN.

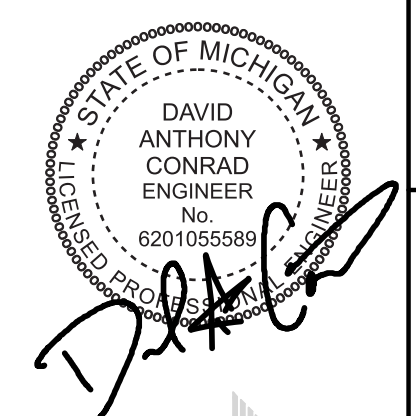
GRAVITY RELIEF HOOD SCHEDULE												
UNIT IDENTIFICATION	SYSTEM SERVED	CFM	THROAT SIZE INCHES	THROAT VELOCITY FPM	STATIC PRESSURE DROP IN. W.G.	HOOD SIZE			CURB HEIGHT INCHES	HOOD CONSTRUCTION	MODEL NUMBER	KEYED NOTES
						WIDTH INCHES	LENGTH INCHES	HEIGHT INCHES				
GRH-1	BCU-1	1050	14x14	771	0.09	28	28	14-3/4	18	ALUMINUM	WRH	

GENERAL NOTES:
 1. MODEL NUMBERS ARE GREENHECK UNLESS OTHERWISE NOTED.
 2. PROVIDE WITH BIRD SCREEN.

PLUMBING CONNECTION SCHEDULE					
UNIT IDENTIFICATION	CW INCHES	HW INCHES	SAW INCHES	VENT INCHES	KEYED NOTES
UR-1	3/4	-	2	1 1/2	
WC-1	1 1/2	-	4	2	
LAV-1	1/2	1/2	1 1/2	1 1/2	
SK-1	3/4	3/4	1 1/2	1 1/2	
SS-1	3/4	3/4	3	-	
EW-1	1/2	-	1 1/2	1 1/2	
SH-1	3/4	3/4	-	-	1
FD-1	-	-	3	-	
FD-2	-	-	3	-	
RH-1	3/4	-	-	-	

GENERAL NOTES:
 1. INDIVIDUAL WATER LINE BRANCHES, WASTE LINES, VENTS, AND TRAPS FOR CONNECTION TO INDIVIDUAL FIXTURES, FIXTURE FITTINGS, AND SPECIALTIES SHALL BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE OR AS INDICATED ON DRAWINGS, WHICHEVER IS GREATER.

KEYED NOTES:
 1. PROVIDE MIXING VALVE.



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FORBES
 CONSULTING ENGINEERS

PROJECT: RENOVATE ARMORY WASHTEAW ARMORY

DESIGNED: RLT
 DRAWN: CHECKED: DAC
 DATE: 04/01/2022
 ISSUED FOR: CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER: PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21456 FILE NO. 511/21326.CAK DWG PROJECT NO. 2483022016

SHEET NUMBER: 80 OF 96

DRAWING NUMBER: MECHANICAL SCHEDULES

M-704

TEMPERATURE CONTROL - SYMBOLS LIST

SCHEMATIC SYMBOLS

SYMBOL	DESCRIPTION
	AIR FLOW CONTROLLER
	AQUASTAT, STRAP ON BULB
	CARBON DIOXIDE SENSOR - WALL MOUNTED
	CARBON DIOXIDE SENSOR - DUCT MOUNTED
	CARBON MONOXIDE SENSOR - WALL MOUNTED
	CARBON MONOXIDE SENSOR - DUCT MOUNTED
	CURRENT SWITCH
	DAMPER - OPPOSED BLADE
	DAMPER - PARALLEL BLADE
	DAMPER MOTOR
	DIFFERENTIAL PRESSURE TRANSMITTER
	DIFFERENTIAL PRESSURE SWITCH
	FIRE ALARM SYSTEM, ADDRESSABLE CONTROL MODULE
	FLOW MEASURING STATION
	FLOW METER
	FLOW SWITCH
	FREEZESTAT
	GAUGE - FLOW
	GAUGE - PRESSURE
	GAUGE - TEMPERATURE
	GUARD FOR STAT OR SENSOR
	HUMIDIFIER
	HUMIDISTAT OR HUMIDITY SENSOR (AS DEFINED ON TC DRAWINGS)
	HUMIDITY SENSOR, DUCT MOUNTED
	LEVEL SWITCH OR TRANSMITTER
	LIMIT SWITCH
	LINE - ELECTRIC
	LINE - INSTRUMENT AIR
	MOTOR STARTER
	OCCUPANCY SENSOR
	PILOT LIGHT OR BEACON R - RED LENS A - AMBER LENS B - BLUE LENS G - GREEN LENS
	PRESSURE SWITCH
	PRESSURE TRANSMITTER
	RELAY, ELECTRIC
	SELECTOR SWITCH, (N=NUMBER OF POSITIONS)
	SIGNAL - DDC/BAS, ANALOG INPUT
	SIGNAL - DDC/BAS, ANALOG OUTPUT
	SIGNAL - DDC/BAS, DIGITAL INPUT
	SIGNAL - DDC/BAS, DIGITAL OUTPUT
	SIGNAL - LON NETWORK POINT, ANALOG INPUT
	SIGNAL - LON NETWORK POINT, ANALOG OUTPUT
	SIGNAL - LON NETWORK POINT, DIGITAL INPUT
	SIGNAL - LON NETWORK POINT, DIGITAL OUTPUT

SCHEMATIC SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
	SMOKE DETECTOR - DUCT MOUNTED
	SMOKE DETECTOR - SPACE MOUNTED
	START/STOP RELAY
	STATIC PRESSURE TRANSMITTER
	STATIC PRESSURE SENSOR OR PROBE
	SWITCH
	TEMPERATURE SENSOR - RIGID ELEMENT IN WELL
	TEMPERATURE SENSOR - STRAP ON BULB
	TEMPERATURE SENSOR - DUCT MOUNTED AVG ELEMENT
	TEMPERATURE SENSOR - DUCT MOUNTED RIGID ELEMENT
	THERMOSTAT OR TEMPERATURE SENSOR (AS DEFINED ON TC DRAWINGS)
	TRANSFORMER
	VALVE - 2 WAY CONTROL VALVE
	VALVE - 3 WAY CONTROL VALVE
	VARIABLE FREQUENCY CONTROLLER
	VELOCITY SENSOR
	VIBRATION SWITCH
	VOLTAGE SENSOR

WIRING SYMBOLS

SYMBOL	DESCRIPTION
	AUDIBLE DEVICE (AS DEFINED ON TC DRAWINGS)
	COIL - MOTOR STARTER CONTACTOR
	COIL - RELAY
	COIL - TIME DELAY RELAY
	COIL - VARIABLE FREQUENCY CONTROLLER CONTACTOR
	COIL - EP OR SOLENOID VALVE
	CONTACT - INSTANT OPERATING, NO
	CONTACT - INSTANT OPERATING, NC
	CONTACT - TIMED AFTER COIL IS ENERGIZED, NOTC
	CONTACT - TIMED AFTER COIL IS ENERGIZED, NCTO
	CONTACT - TIMED AFTER COIL IS DE-ENERGIZED, NOTO
	CONTACT - TIMED AFTER COIL IS DE-ENERGIZED, NCTC
	GROUND
	MOTOR, SINGLE PHASE
	PILOT LIGHT OR BEACON R - RED LENS A - AMBER LENS B - BLUE LENS G - GREEN LENS
	PILOT LIGHT, WITH PUSH-TO-TEST
	PUSH BUTTON - MOMENTARY CONTACT, NO
	PUSH BUTTON - MOMENTARY CONTACT, NC
	PUSH BUTTON - MOMENTARY CONTACT, NO & NC
	PUSH BUTTON - MOMENTARY, NO (MUSHROOM HEAD)
	PUSH BUTTON - MOMENTARY, NC (MUSHROOM HEAD)

WIRING SYMBOLS (CONT.)

SYMBOL	DESCRIPTION
	SWITCH - 2 POSITION SELECTOR
	SWITCH - 3 POSITION SELECTOR HAND/OFF/AUTO
	SWITCH - FLOW (AIR, WATER, ETC.), NO
	SWITCH - FLOW (AIR, WATER, ETC.), NC
	SWITCH - LIMIT, NO
	SWITCH - LIMIT, NO, HELD CLOSED
	SWITCH - LIMIT, NC
	SWITCH - LIMIT, NC, HELD OPEN
	SWITCH - LIQUID LEVEL, NO
	SWITCH - LIQUID LEVEL, NC
	SWITCH - MANUAL SPST, NO
	SWITCH - MANUAL DPDT, NO
	SWITCH - MANUAL SPST, NC
	SWITCH - MANUAL DPDT, NC
	SWITCH - MANUAL SPDT
	SWITCH - MANUAL DPDT
	SWITCH - PRESSURE & VACUUM, NO
	SWITCH - PRESSURE & VACUUM, NC
	SWITCH - TEMPERATURE ACTUATED, NO
	SWITCH - TEMPERATURE ACTUATED, NC
	THERMAL OVERLOAD, SINGLE PHASE
	THERMAL OVERLOAD CONTACTS - 3 PHASE
	TRANSFORMER
	WIRE TERMINATION AT DEVICE
	WIRE TO WIRE TERMINATION
	WIRING NOT CONNECTED

WIRING TERMS

ABBREVIATION	DESCRIPTION
SPST	SINGLE POLE SINGLE THROW
SPDT	SINGLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
DPDT	DOUBLE POLE DOUBLE THROW
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NOTO	NORMALLY OPEN TIMED OPEN
NOTC	NORMALLY OPEN TIMED CLOSED
NCTO	NORMALLY CLOSED TIMED OPEN
NCTC	NORMALLY CLOSED TIMED CLOSED

NOTES:
1. REFER TO MECHANICAL STANDARDS ON DRAWING M-001 FOR ADDITIONAL SYMBOLS & ABBREVIATIONS THAT MAY BE USED ON TEMPERATURE CONTROL DRAWINGS.
2. SOME SYMBOLS & ABBREVIATIONS SHOWN MAY NOT APPLY TO THIS PROJECT.

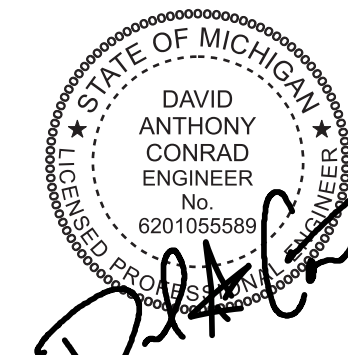
ABBREVIATION LIST

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
AAV	AUTOMATIC AIR VENT	IAQ	INDOOR AIR QUALITY
ACC	AIR COOLED CONDENSER	IN	INCHES
ACCU	AIR COOLED CONDENSING UNIT	JC	JANITOR'S CLOSET
AD	ACCESS DOOR	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	KWH	KILOWATT-HOUR
AHU	AIR HANDLING UNIT	LBS/HR	POUNDS PER HOUR
ALT	ALTERNATE	LON	LONTALK (AN ECHELON PRODUCT)
AMP	AMPERE	MA	MIXED AIR
APD	AIR PRESSURE DROP	MAT	MIXED AIR TEMPERATURE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS	MAU	MAKE-UP AIR UNIT
ATM	ATMOSPHERE	MAX	MAXIMUM
AUX	AUXILIARY	MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
BAS	BUILDING AUTOMATION SYSTEM	MCC	MOTOR CONTROL CENTER
C	COMMON	MECH	MECHANICAL
CFM	CUBIC FEET PER MINUTE	MEZZ	MEZZANINE
CH	CHILLER	MFR	MANUFACTURER
CHWP	CHILLED WATER PUMP	MIN	MINIMUM
CHWR	CHILLED WATER RETURN	MISC	MISCELLANEOUS
CHWS	CHILLED WATER SUPPLY	MMBH	MILLION BRITISH THERMAL UNITS PER HOUR
CLG	COOLING	M/S	MOTOR STARTER
CLP	COMPUTER LOOP PUMP	MTD	MOUNTED
CLR	COMPUTER LOOP RETURN	MTR	MOTOR
CLS	COMPUTER LOOP SUPPLY	MV	MANUAL AIR VENT
CO2	CARBON DIOXIDE	MZ	MULTI-ZONE
COND	CONDENSATE	NC	NORMALLY CLOSED
CONT	CONTINUATION OR CONTINUED	NCTC	NORMALLY CLOSED TIMED CLOSED
CONTR	CONTRACTOR	NCTO	NORMALLY CLOSED TIMED OPEN
CONV	CONVECTOR	NIC	NOT IN CONTRACT
COS	CENTRAL OPERATOR STATION	NFPA	NATIONAL FIRE PROTECTION AGENCY
CP	CIRCULATING PUMP	NO	NORMALLY OPEN
CT	COOLING TOWER	NOTC	NORMALLY OPEN TIMED CLOSED
CUH	CABINET UNIT HEATER	NOTO	NORMALLY OPEN TIMED OPEN
CW	DOMESTIC COLD WATER	NSB	NIGHT SETBACK
CWP	CONDENSER WATER PUMP	OA	OUTSIDE AIR
CWR	CONDENSER WATER RETURN	OAT	OUTSIDE AIR TEMPERATURE
CWS	CONDENSER WATER SUPPLY	PACU	PACKAGED AIR CONDITIONING UNIT
DA	DISCHARGE AIR	PD	PRESSURE DROP (FEET OF WATER)
DAT	DISCHARGE AIR TEMPERATURE	PHR	PERIMETER HEAT RETURN
DB	DRY BULB TEMPERATURE	PHS	PERIMETER HEAT SUPPLY
DDC	DIRECT DIGITAL CONTROL	PNL	PANEL
DEG	DEGREES	PPM	PARTS PER MILLION
DMPR	DAMPER	PRV	PRESSURE REDUCING VALVE
D/N	DAY/NIGHT	PSI	POUNDS PER SQUARE INCH
DN	DOWN	R	RETURN
DPR	DAMPER	RA	RETURN AIR
DRAWG	DRAWING	RAT	RETURN AIR TEMPERATURE
DWH	DOMESTIC WATER HEATER	RCP	RADIANT CEILING PANEL
DX	DIRECT EXPANSION	REL	RELIEF AIR
(E)	EXISTING	REQD	REQUIRED
EA	EACH	RF	RETURN FAN
EA	EXHAUST AIR	RH	RELATIVE HUMIDITY
EAT	ENTERING AIR TEMPERATURE	RTU	ROOF TOP UNIT
ECUH	ELECTRIC CABINET UNIT HEATER	SA	SUPPLY AIR
EDB	ENTERING DRY BULB	SF	SUPPLY FAN
EF	EXHAUST FAN	SP	STATIC PRESSURE
EFF	EFFICIENCY	S/S	START/STOP
EHC	ELECTRIC HEATING COIL	STD	STANDARD
ELEC	ELECTRICAL	STM	STEAM
EROP	ELECTRIC RADIANT CEILING PANEL	SZ	SINGLE-ZONE
ERU	ENERGY RECOVERY UNIT	S/W	SUMMER/WINTER
ELH	ELECTRIC UNIT HEATER	SWTCH	SWITCH
EWB	ENTERING WET BULB	TC	TEMPERATURE CONTROL
EWT	ENTERING WATER TEMPERATURE	TOP	TEMPERATURE CONTROL PANEL
EXH	EXHAUST	TEMP	TEMPERATURE
F	DEGREES FAHRENHEIT	THR	TERMINAL HEATING RETURN
F&B	FACE AND BYPASS DAMPER	THIS	TERMINAL HEATING SUPPLY
FAS	FIRE ALARM SYSTEM	TSP	TOTAL STATIC PRESSURE
FCU	FAN COIL UNIT	TU	TERMINAL UNIT
FLR	FLOOR	TYP	TYPICAL
FM	FLOW MEASURING DEVICE	UH	UNIT HEATER
FT	FEET	UL	UNDERWRITER'S LABORATORY
FTR	FINNED TUBE RADIATION	UV	UNIT VENTILATOR
GPW	GALLONS PER MINUTE	VAV	VARIABLE AIR VOLUME
GRH	GRAVITY RELIEF HOOD	VFC	VARIABLE FREQUENCY CONTROLLER
HOA	HAND/OFF/AUTO	VUV	VERTICAL UNIT VENTILATOR
HP	HEAT PUMP	WC	WATER COLUMN
HP	HORSEPOWER	XFMR	TRANSFORMER
HPLP	HEAT PUMP LOOP PUMP		
HPLR	HEAT PUMP LOOP RETURN		
HPLS	HEAT PUMP LOOP SUPPLY		
HR	HOUR		
HTG	HEATING		
HV	HEATING VENTILATING		
HVAC	HEATING, VENTILATING, AIR CONDITIONING		
HWH	HOT WATER HEATING		
HWHR	HOT WATER HEATING RETURN		
HWHS	HOT WATER HEATING SUPPLY		
HW	DOMESTIC HOT WATER		
HWR	DOMESTIC HOT WATER RETURN		
HX	HEAT EXCHANGER		

GENERAL NOTES

- THESE GENERAL NOTES SHALL BE APPLICABLE FOR ALL TC DRAWINGS.
- EXISTING CONTROLS TO BE RETROFITTED TO NEW LONWORKS DDC CONTROLS AS SPECIFIED AND INDICATED HEREIN. FOR RETROFIT, TC CONTRACTOR SHALL REMOVE ALL EXISTING CONTROLS AND VERIFY CONTROL INTERFACE AND FIELD INSTALL NEW CONTROLS. WHERE APPLICABLE, REMOVE EXISTING CONTROL COMPONENTS IN THEIR ENTIRETY. IF REQUIRED, PROVIDE COVER PLATES OVER HOLES IN WALLS AS A RESULT OF EXISTING CONTROL COMPONENT REMOVAL.
- "PROVIDE" IS DEFINED AS "FURNISH AND INSTALL".
- TC CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL APPLICABLE CODES AND STANDARDS.
- FOR TEMPERATURE CONTROL DRAWINGS ONLY: ALL DETAILED INFORMATION IDENTIFIED WITH HEAVY LINE WEIGHT SHALL BE PROVIDED BY TC CONTRACTOR. ALL OTHER INFORMATION IDENTIFIED WITH LIGHT LINE WEIGHT SHALL BE PROVIDED BY OTHER TRADES.
- ALL CONTROL DETAILS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS' WORK AND SHALL NOT BE MISTAKEN AS SHOP DRAWINGS FOR ACTUAL INSTALLATION.
- FOR ALL ROOF TOP HVAC EQUIPMENT, TC CONTRACTOR SHALL PROVIDE 1" CONDUIT THROUGH ROOF CURB FOR CONTROL WIRING.
- TC CONTRACTOR SHALL PROVIDE DDC CONTROLLERS AS REQUIRED TO MEET INTENT OF DESIGN DOCUMENTS. REFER TO THE PLANS FOR THE DDC FUNCTIONS THAT APPLY TO EACH MECHANICAL SYSTEM.
- ALL TC CONTRACTOR PROVIDED COMPONENTS AND WIRING SHALL BE LABELED PER DMVA REQUIREMENTS. COORDINATE WIRING REQUIREMENTS WITH THE DMVA DDC REPRESENTATIVE.**
 - TC CONTRACTOR SHALL PERFORM WIRING TERMINATION AT END DEVICES - SENSORS, ACTUATORS, ETC.**
 - DMVA PERSONNEL SHALL PERFORM WIRING TERMINATION AT THE DDC PANEL POINT TERMINATIONS AFTER TC CONTRACTOR PERFORMS POINT-TO-POINT CHECKOUT OF WIRING.**
 - TC CONTRACTOR SHALL PERFORM POINT-TO-POINT VERIFICATION WITH WRITTEN CHECKLISTS AND SUBMIT TO CONTRACTOR.**
- DDC CONTROL PANEL WIRING, CONFIGURATION, AND RACEWAYS ARE AS SHOWN IN DDC ENCLOSURE ELEVATION DETAIL.**
 - DMVA PERSONNEL SHALL PERFORM ALL DDC CONTROLLER 'DISCOVERY', GRAPHICS, PROGRAMMING, TIME-OF-DAY PROGRAMMING, ALARM REPORTS, & TREND GRAPH DEVELOPMENT.**
- ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE ELECTRICAL SPECIFICATIONS.
- VARIABLE FREQUENCY CONTROLLER, FAN AND PUMP MOTOR STARTERS, STARTER WIRING, CONTROL VOLTAGE TRANSFORMERS AND ASSOCIATED POWER WIRING SHALL BE PROVIDED BY OTHER TRADES.
- DUCT SMOKE DETECTORS SHALL BE FURNISHED, INSTALLED AND WREDED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. ELECTRICAL SHALL PROVIDE FIRE ALARM SYSTEM CONTROL MODULES FOR REQUIRED SAFETIES TO MOTOR STARTERS OR VFC'S AS INDICATED. CONTROL MODULES SHALL BE LOCATED NEAR RESPECTIVE MOTOR STARTERS OR VFC'S. TC CONTRACTOR SHALL PROVIDE INTERLOCK WIRING FROM CONTROL MODULES TO MOTOR STARTERS OR VFC'S.
- ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE BY TC CONTRACTOR UNLESS OTHERWISE NOTED. TC CONTRACTOR SHALL COORDINATE WITH VFC AND MOTOR STARTER SUPPLIERS TO DETERMINE EXACT WIRING TERMINATION POINTS.
- ALL DDC AND CONTROL INTERLOCK WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
- ALL ELECTRICAL WIRING AND RACEWAY SYSTEMS SHALL COMPLY WITH ELECTRICAL SPECIFICATION REQUIREMENTS.
- TC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER SUPPLIES REQUIRED FOR TC SYSTEM UNLESS OTHERWISE NOTED. REFER TO ELECTRICAL PANEL SCHEDULES FOR SPARE CIRCUITS OR CIRCUITS DEDICATED TO TEMPERATURE CONTROLS. COORDINATE CIRCUIT USE WITH ELECTRICAL CONTRACTOR.
- TC CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
- TC CONTRACTOR SHALL PROVIDE GUARDS FOR SPACE TEMP SENSORS AS INDICATED ON DRAWINGS.
- TC CONTRACTOR SHALL PROVIDE AUXILIARY PANELS FOR REQUIRED PANEL MOUNTED EQUIPMENT SUCH AS RELAYS, TRANSDUCERS, CONTROL TRANSFORMERS, ETC. AUXILIARY PANELS SHALL BE LOCATED NEXT TO ASSOCIATED DDC PANEL.
- REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSED IN AN ENCLOSURE PROVIDED BY THE TC CONTRACTOR.
- CONTROL TRANSFORMERS WHEN REQUIRED SHALL BE SIZED FOR 150% OF ACTUAL LOAD.
- FREEZESTATS SHALL BE MOUNTED ON UPSTREAM FACE OF COOLING COILS WHEN LOCATED AFTER HEATING COILS. FREEZESTAT QUANTITY SHALL BE ONE PER 20 SQ. FT OF CROSS SECTIONAL AREA.
- GO/NO-GO CURRENT SWITCHES SHALL BE USED FOR FAN AND PUMP OPERATIONAL STATUS.
- ALL CONTROL VALVES, CONTROL DAMPERS AND ASSOCIATED CONTROL ACTUATORS IDENTIFIED ON TC DRAWINGS SHALL BE FURNISHED BY TC CONTRACTOR UNLESS OTHERWISE NOTED. DAMPER SIZE AND LOCATIONS ARE INDICATED ON MECHANICAL FLOOR PLAN DRAWINGS.
- ALL CONTROL VALVES AND DAMPERS FURNISHED BY THE TC CONTRACTOR SHALL BE INSTALLED BY THE MECHANICAL CONTRACTOR. ALL PIPE PENETRATIONS AND BASIC FITTINGS REQUIRED FOR SENSOR INSTALLATIONS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR.
- DAMPER ACTUATORS SHALL BE INSTALLED BY TC CONTRACTOR.
- ALL INSTRUMENTATION TUBING REQUIRED FOR DPS AND DPT COMPONENT INSTALLATIONS SHALL BE PROVIDED BY TC CONTRACTOR.
- TC CONTRACTOR SHALL FIELD MOUNT ALL REQUIRED PACKAGED CONTROL COMPONENTS FURNISHED BY EQUIPMENT SUPPLIERS WHERE INDICATED. ALL REQUIRED 24V AND 120V FIELD WIRING SHALL BE PROVIDED BY TC CONTRACTOR UNLESS NOTED OTHERWISE. TC CONTRACTOR SHALL COORDINATE SPECIFIC SYSTEM WIRING TERMINATION REQUIREMENTS WITH PACKAGED EQUIPMENT SUPPLIERS.

GENERAL CONTRACTOR SHALL CARRY \$25,000 ALLOWANCE FOR CONTROLS RELATED WORK.



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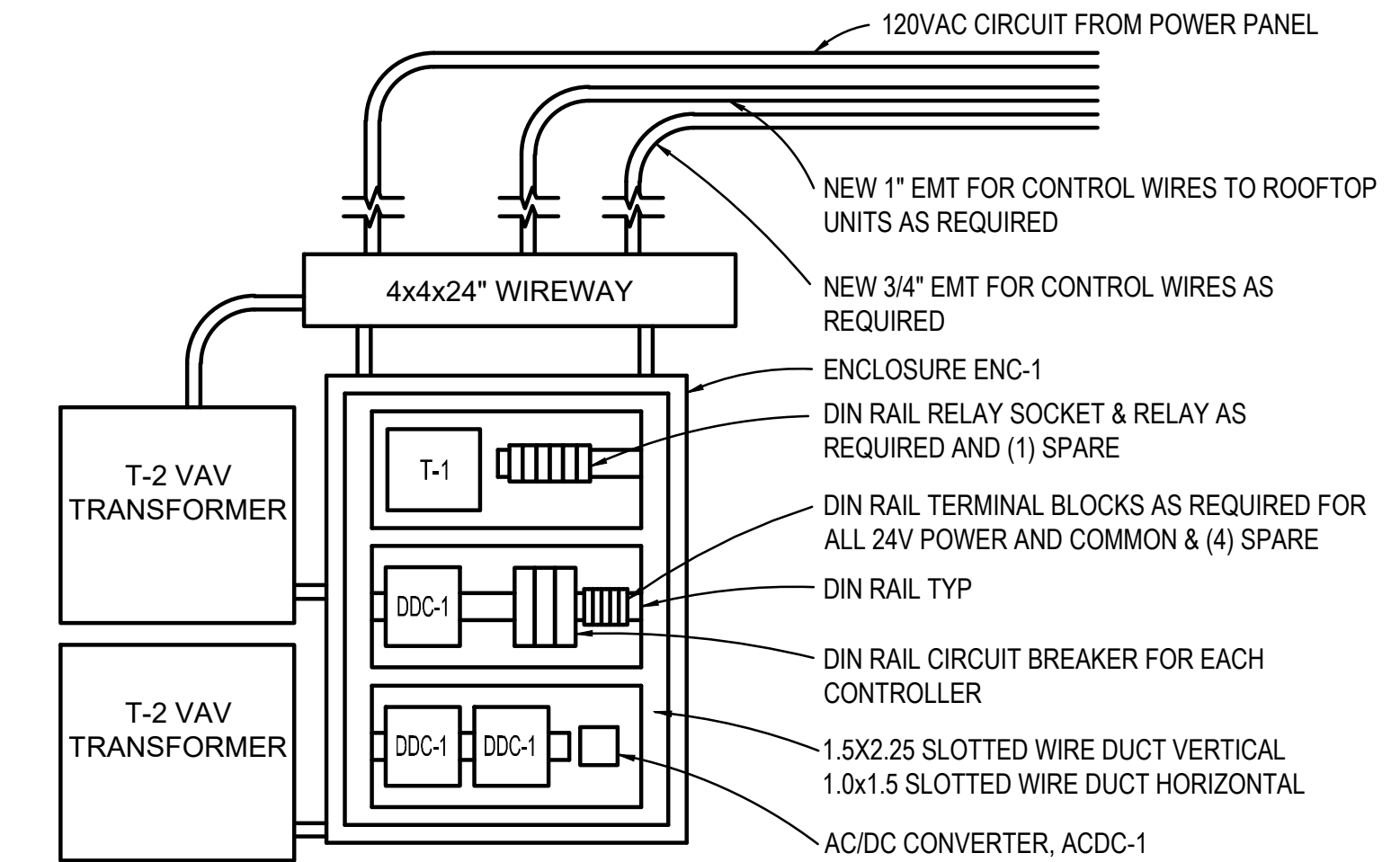
GENERAL NOTES

GENERAL NOTES ON TC DRAWING M-801 APPLY TO THIS DRAWING.

DDC EQUIPMENT SCHEDULE

MARK	LABEL	DESCRIPTION	BASIS OF DESIGN	SERVICE	LOCATION	QTY / WIRE SIZE TO EQUIPMENT	NOTES
ENC-1	ENC-1	DDC ENCLOSURE	KELE - RET2620	DDC EQUIPMENT ENCLOSURE	MECHANICAL ROOM	-	NO SUBSTITUTIONS
ENC-2	ENC-2	DDC ENCLOSURE	KELE - RET2620	DDC EQUIPMENT ENCLOSURE	MECHANICAL ROOM	-	NO SUBSTITUTIONS
ENC-3	ENC-3	DDC ENCLOSURE	KELE - RET2620	DDC EQUIPMENT ENCLOSURE	MECHANICAL ROOM	-	NO SUBSTITUTIONS
DDC-1	DDC-1	PROGRAMMABLE CONTROLLER	SMART CONTROLS - EC240 OR CIRCON EQUIVALENT	DDC	DDC ENCLOSURE	-	OR APPROVED EQUAL
DDC-2	CATNET	CATNET INTERFACE W/ LON CARD	CATNET or divioTECH - CLI-FT	ENC-1	ONE PER BUILDING, ENC-1	-	NO SUBSTITUTIONS
DDC-3	WEBSERVER	CATNET WEBSERVER	CATNET - HMI CH-2 or divioTECH - CH-2 WEB SERVER	ENC-1	ONE PER BUILDING, ENC-1	-	NO SUBSTITUTIONS
DDC-4	MODBUS	INTERFACE MODBUS	CATNET - CMI-485	ENC-1	DDC ENCLOSURE	-	NO SUBSTITUTIONS
T-1	T-1-ENC#	TRANSFORMER w/ OUTLET	AIR PROD. & CONTROLS or divioTECH - T-PB-202-0	DDC ENCLOSURE EQUIPMENT	DDC ENCLOSURE	-	
T-2	T-2-ENC#	TRANSFORMER	RIB - PSH200A-LVC	VAV CONTROLLERS	DDC ENCLOSURE	-	
TEMP-1	TEMP-1-AREA	DDC ROOM TEMPERATURE SENSOR	BAPI - BA/10K-3-B4 or divioTECH SAP-10K-3-R	ROOM TEMP	SEE LAYOUT, WALL MOUNTED 60" AFF	3 CONDUCTOR / 18 GA.	
TEMP-2	TEMP-2-AHU# or RTU#	DUCT/EQUIP TEMPERATURE SENSOR	BAPI - BA/10K-3-D-18" or divioTECH SAP-10K-3-D-18"-MB	18" AIRSTREAM TEMP - POINT SENSOR	DUCT/AHU/RTU - OA, RA, OR SA	3 CONDUCTOR / 18 GA.	18 INCHES, TEMP. AVERAGING
*	*	*	BAPI - BA/10K-3-RA-18" or divioTECH SAP-10K-3-RA-18"-MB	18" AIRSTREAM TEMP /RIGID AVERAGING	DUCT/AHU/RTU - MA OR AFTER COIL	3 CONDUCTOR / 18 GA.	18 INCHES, TEMP. AVERAGING
*	*	*	BAPI - BA/10K-3-RA-24" or divioTECH SAP-10K-3-RA-24"-MB	24" AIRSTREAM TEMP /RIGID AVERAGING	DUCT/AHU/RTU - MA OR AFTER COIL	3 CONDUCTOR / 18 GA.	24 INCHES, TEMP. AVERAGING
*	*	*	BAPI - BA/10K-3-RA-36" or divioTECH SAP-10K-3-RA-36"-MB	36" AIRSTREAM TEMP /RIGID AVERAGING	DUCT/AHU/RTU - MA OR AFTER COIL	3 CONDUCTOR / 18 GA.	36 INCHES, TEMP. AVERAGING
TEMP-3	TEMP-3-AHU# or RTU#	PIPE TEMPERATURE SENSOR	BAPI - BA/10K3-S or divioTECH SAP-10K-3-4"-MB	WATER TEMP	PIPE	3 CONDUCTOR / 18 GA.	ORDER WELL BASED ON PIPE MATERIAL
TEMP-4	TEMP-4-GREASE HOOD	EXHAUST COLLAR THERMOSTAT	VULCAN - Calstat 1E2B9-85	EXHAUST AIR HIGH LIMIT TEMP SENSOR	HOOD EXHAUST DUCT	2 CONDUCTOR / 18 GA.	
TEMP-5	TEMP-5-AREA	LON ROOM SENSOR	ENGENUITY or divioTECH - SI-40-L-THCV	ROOM TEMP / CO2 / HUMIDITY / VOC	SEE LAYOUT, WALL MOUNTED 60" AFF	4 CONDUCTOR / 18 GA.	PROVIDE 24VAC FROM DDC PANEL
HUM-1	HUMIDITY-1-AREA NAME	DDC ROOM HUMIDITY SENSOR	BAPI - BA/H200-R or divioTECH - SAP-H200-R-SP	ROOM HUMIDITY	SEE LAYOUT, WALL MOUNTED 60" AFF	3 CONDUCTOR / 18 GA.	
HUM-2	HUMIDITY-1-AHU#	DDC DUCT HUMIDITY SENSOR	BAPI BA/H200-D-WP or divioTECH - SAP-H200-D	DUCT HUMIDITY	VARIES	3 CONDUCTOR / 18 GA.	
FR-1	FR-1-AHU# or RTU#	FREEZESTAT	ACI or divioTECH - FS-4	MECH EQUIPMENT	COOLING COIL	3 CONDUCTOR / 18 GA.	
OAT-1	OAT-1	OUTDOOR AIR TEMP SENSOR	BAPI - BA/10K-3-O-EU or divioTECH - SAP-10K-3-O-RDO	OA TEMPERATURE	BLDG EXTERIOR	4 CONDUCTOR / 18 GA.	
OATH-1	OATH-1	OUTDOOR AIR TEMP / HUMIDITY SENSOR	BAPI - BA/T1K10 TO 100FJ-H210-O-BB	OA TEMPERATURE & HUMIDITY	BLDG EXTERIOR	4 CONDUCTOR / 18 GA.	
CS-1	CS-1-(DEVICE NAME)	CURRENT SWITCH	ACI - A/MSCS or divioTECH - MSCS	AHU/PUMPS/EXHAUST FANS	VARIES	3 CONDUCTOR / 18 GA.	
CO2-1	CO2-1-AHU#	DUCT CO2 SENSOR	VERIS or divioTECH - CDE	CO2	RETURN DUCT	3 CONDUCTOR / 18 GA.	
CO2-2	CO2-2-AREA	ROOM CO2 SENSOR	VERIS or divioTECH - CDE	CO2	SEE LAYOUT, WALL MOUNTED 60" AFF	3 CONDUCTOR / 18 GA.	
SD-1	SD-1	SMOKE DETECTOR	AIR PRODUCTS & CONTROLS - SL-2000-P	AHU/RTU	RETURN DUCT BEFORE FRESH AIR	-	SEE DETAILS FOR EXACT LOCATION
DIN RAIL	-	DIN RAIL	KELE - BAM-1000	MECHANICAL EQUIP	DDC ENCLOSURE / RTU	-	SEE DETAILS FOR EXACT LOCATION
WIRE DUCT	-	SLOTTED WIRE DUCT	IBOCO - T1E-2222W	MECHANICAL EQUIP	DDC ENCLOSURE	2 CONDUCTOR / 18 GA.	
RELAY-1	(VARIES ON DEVICE)	RELAY	RIB - RIBU1C	MECHANICAL EQUIP	VARIES	-	SINGLE POLE DOUBLE THROW 10A
RELAY-2	(VARIES ON DEVICE)	DIN RAIL RELAY SOCKET / SPDT RELAY	VERIS - VBD1B-F WITH VMD1B-F24A	MECHANICAL EQUIP	MECH ROOM	2 CONDUCTOR / 18 GA.	SINGLE POLE DOUBLE THROW 15A
RELAY-3	(VARIES ON DEVICE)						
RELAY-4	(VARIES ON DEVICE)	RELAY W/OVERRIDE	RIB - RIB2421SB	AHU/RTU FANS & ALL PUMPS	VARIES	-	SINGLE POLE DOUBLE THROW 20A
TBLCK	-	TERMINAL BLOCK	KELE - CDU4N	MECHANICAL EQUIP	DDC ENCLOSURE / RTU	2 CONDUCTOR / 18 GA.	SEE DETAILS FOR EXACT LOCATION
BRKR	-	CIRCUIT BREAKER FOR CONTROLLER	CBI ELECTRIC - QL-2	PROGRAMMABLE CONTROLLER	DDC ENCLOSURE / RTU	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
ACT-1-FS	ACT-1-(DEVICE NAME)	DAMPER ACTUATOR / FAILSAFE	KMC CONTROLS - MEP-7552	DAMPERS	VARIES	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
ACT-1-NFS	ACT-1-(DEVICE NAME)	DAMPER ACTUATOR / NON-FAILSAFE	KMC CONTROLS - MEP-7802	DAMPERS	VARIES	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
ACT-2-2W	ACT-2-(DEVICE NAME)	1/2" & 3/4" VALVE ACTUATOR; 2W VALVE	KMC CONTROLS - MEP-4252V	CONTROL VALVES	VARIES	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
ACT-2-3W	ACT-2-(DEVICE NAME)	1/2" & 3/4" VALVE ACTUATOR; 3W VALVE	KMC CONTROLS - MEP-4252V	CONTROL VALVES	VARIES	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
ACT-3-2W	ACT-3-(DEVICE NAME)	1" - 3" VALVE ACTUATOR; ; 2W VALVE	KMC CONTROLS - MEP-4552V	CONTROL VALVES	VARIES	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
ACT-3-3W	ACT-3-(DEVICE NAME)	1" - 3" VALVE ACTUATOR; ; 3W VALVE	KMC CONTROLS - MEP-4552V	CONTROL VALVES	VARIES	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
OCC-1	OCC-1-RM#	OCCUPANCY SENSOR	WATTSTOPPER - CX100	ROOM OCCUPANCY	SEE LAYOUT, WALL MOUNTED 6" FROM CEILING	4 CONDUCTOR / 18 GA.	SHIELDED/ PWR-SIGNAL
ACDC-1	ACDC-1	AC TO DC VOLTAGE CONVERTER	ACI - PS1.5	OCCUPANCY SENSORS	DDC ENCLOSURE	-	
VAV-1-20	VAV-#-LOCATION	TERMINAL UNIT CONTROLLER	CIRCON - VAV-332-IMV	HVAC EQUIP	SEE MECHANICAL SHEETS	2 CONDUCTOR / 18 GA. PWR	NO SUBSTITUTIONS, POWER WIRE FROM T-2
DP-1	DP-1	DUCT DIFFERENTIAL PRESSURE SENSOR	ACI - A/LP2-3-10	MECHANICAL EQUIP	MAIN SUPPLY DUCT	4 CONDUCTOR / 18 GA. SHIELD	
DP-2	DP-2	WATER DIFFERENTIAL PRESSURE SENSOR	ACI - WPR	MECHANICAL EQUIP	HWH SUPPLY/RETURN PIPING	4 CONDUCTOR / 18 GA. SHIELD	
FM-1	FM-OA-RTU#	AIRFLOW MEASURING DEVICE - DUCT	EBTRON GOLD-SERIES AIRFLOW ARRAY	AIRSTREAM CFM	VARIES	3 CONDUCTOR / 18 GA.	SEE DETAILS FOR EXACT LOCATION
FM-2	FM-OA-RTU#	AIRFLOW MEASURING DEVICE - RTU OA	AIR MONITOR VOLU-FLO/OAM II	OA DP CFM	VARIES	3 CONDUCTOR / 18 GA.	SEE DETAILS FOR EXACT LOCATION

NOTES:
 1. CONTRACTOR TO FURNISH AND INSTALL MATERIALS IN SCHEDULE. WIRE SHOWN TO BE PULLED INTO ENCLOSURES, LABELED AND COILED AT EACH END.
 2. SUBSTITUTIONS SHALL BE REVIEWED AND APPROVED BY DMVA ENGINEERING PRIOR TO INSTALLATION.
 3. ACTUATOR ACT-1-FS & ACT-1-NFS MODEL NUMBER DEPENDS ON DEVICE SIZE. INSTALL PROPERLY SIZED TORQUE ACTUATOR BASED ON MANUFACTURER'S RECOMMENDATIONS.



DDC ENCLOSURE ELEVATION (TYP)

NO SCALE

NOTES:

- REFER TO DDC EQUIPMENT ELEVATION DETAIL FOR DDC CONTROL ENCLOSURE LAYOUT.
- REFER TO MECHANICAL DRAWINGS FOR EQUIPMENT LOCATIONS AND QUANTITIES.

DDC GENERAL NOTES

- PRIOR TO ANY INSTALLATION OF DDC EQUIPMENT OR DDC WIRING, CONTRACTOR SHALL REQUEST A DDC PRECONSTRUCTION MEETING WITH DMVA **IN-HOUSE TECHNICIAN** TO DISCUSS CONSTRUCTION SCHEDULING, PRECISE DDC EQUIPMENT LOCATIONS, STARTUPS, LABELING PROCEDURES, AND COMMISSIONING.
- CONTRACTOR MUST FOLLOW A DDC WIRE COLOR SCHEDULE FOR ALL DDC WIRING INSTALLED. THIS SCHEDULE WILL BE AGREED UPON DURING THE PRECONSTRUCTION MEETING.
- CONTRACTOR TO INSTALL A MINIMUM 3/4" CONDUIT FOR ALL DDC WIRING. CONTRACTOR IS ALLOWED TO INSTALL J-HOOKS 4" O.C. FOR DDC CONTROL WIRING ONLY IN AREAS ABOVE A SUSPENDED CEILING. ALL CONDUIT IN WALLS TO BE STUBBED INTO CEILING SPACE.
- CONTRACTOR TO INSTALL A MINIMUM 1" CONDUIT THROUGH ROOFTOP UNIT CURBS FOR DDC WIRING.
- CONTRACTOR SHALL PULL ALL DDC WIRING AS SHOWN ON DDC FLOOR PLAN AND DDC EQUIPMENT SCHEDULE. ALL WIRES SHALL BE LABELED WITH A LABEL MAKER APPROVED BY DMVA ENGINEERING. **NO** HAND WRITTEN LABELS WILL BE ALLOWED. ALL LABELS LOCATED IN ENCLOSURE ENC-1 MUST BE PLACED 6" DOWN ON WIRE ONCE INSIDE THE ENCLOSURE. DO NOT LOCATE LABEL AT THE END OF WIRE.
- ALL INPUT/OUTPUT CONTROL WIRES TO BE LON RATED, SEE SPECIFICATIONS. **DMVA STAFF** SHALL TERMINATE WIRED AT TERMINAL STRIPS AND/OR DDC CONTROLLER(S).
- DDC SEQUENCE AND PROGRAMMING WILL BE COMPLETED BY DMVA **IN-HOUSE TECHNICIAN**, SEE SPECIFICATIONS.
- INSTALL TEMPERATURE SENSOR: TEMP-1, 60" AFF.
- INSTALL OCCUPANCY SENSOR: OCC-1, 6" FROM CEILING.
- INSTALL OAT-1/OAH-1: ON NORTH FACING EXTERIOR WALL, MAKE WEATHERTIGHT.
- PRINT COPY OF DDC WIRE COLOR SCHEDULE AND SCHEMATIC AND SECURE TO THE BACK OF THE DOOR IN ENC-1.
- PROVIDE AND INSTALL ALL END DEVICES SHOWN.



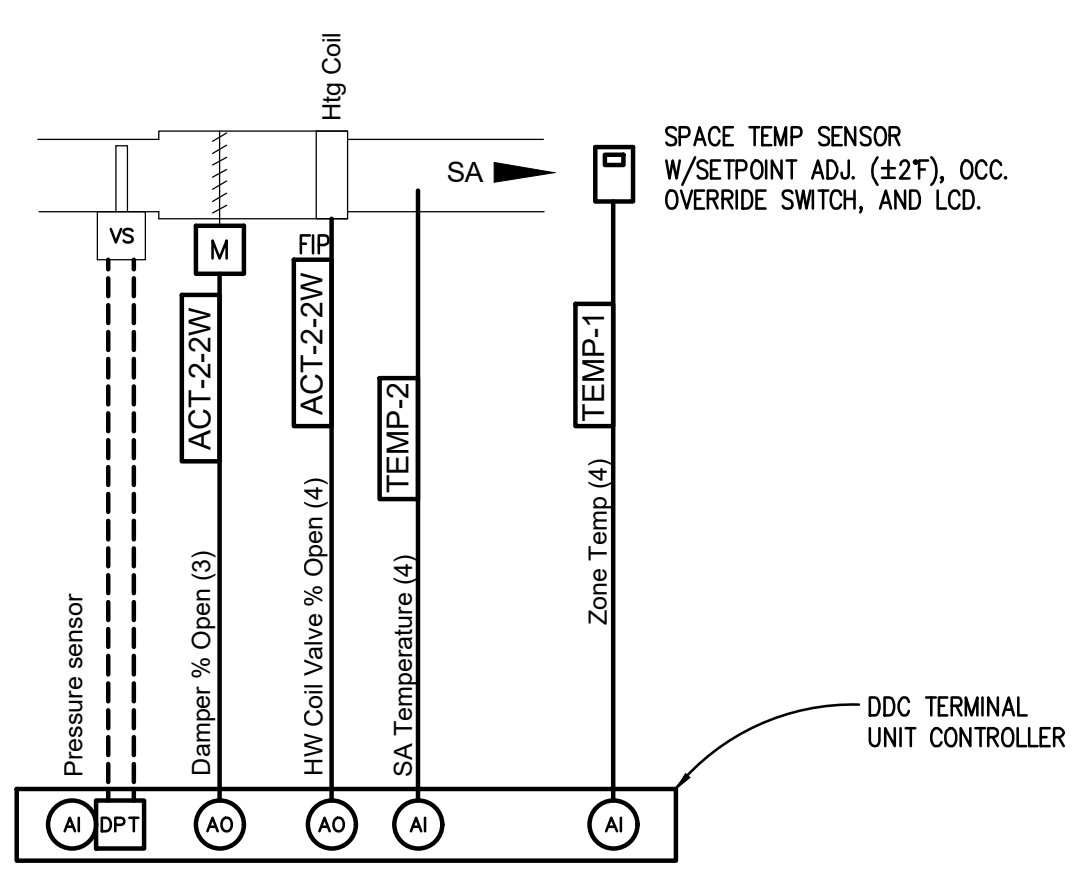
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GENERAL NOTES

GENERAL NOTES ON TC DRAWING M-801 APPLY TO THIS DRAWING.



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AIR TERMINAL UNIT VAV-111 CONTROL

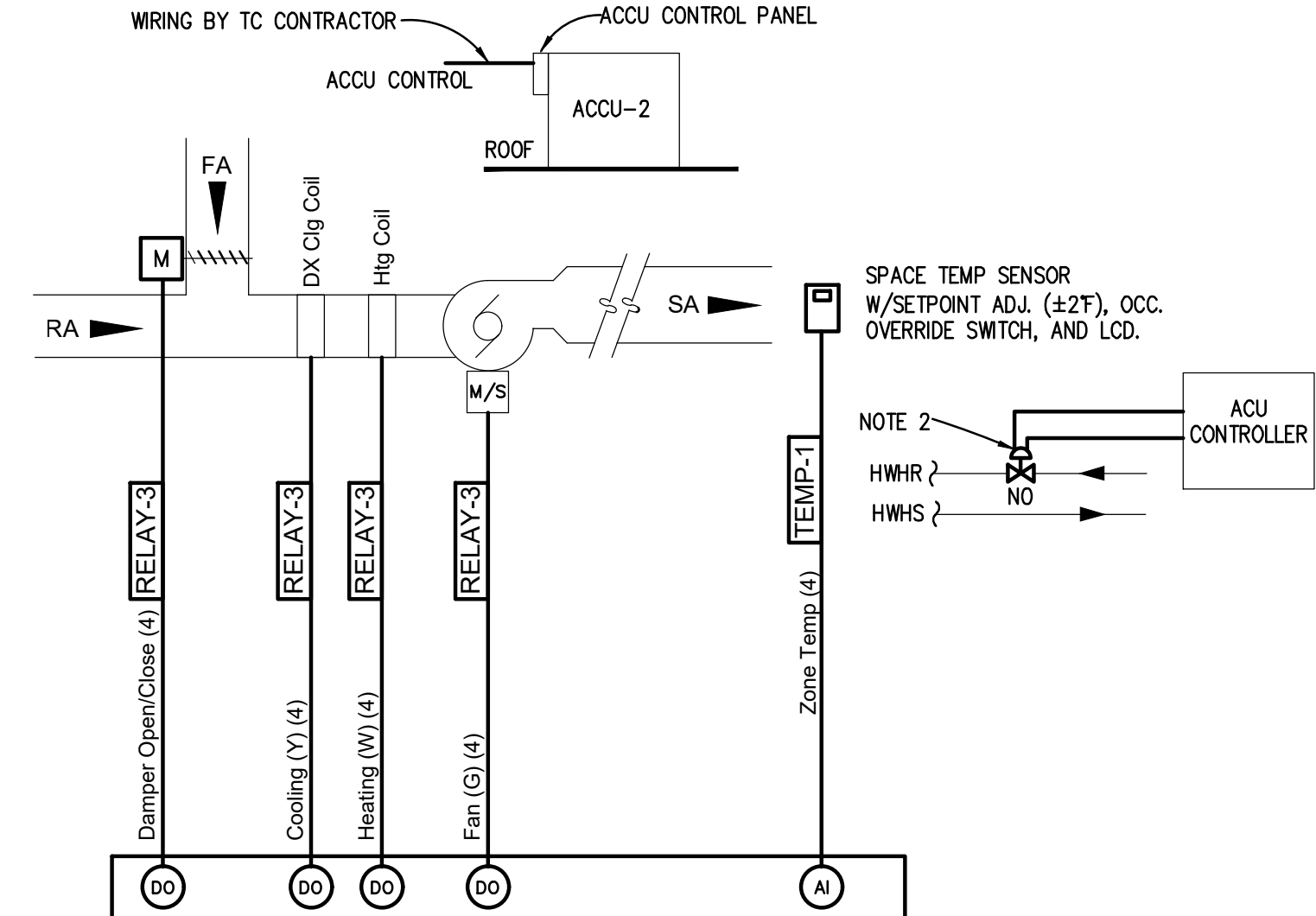
REFER TO AIR TERMINAL UNIT SCHEDULE FOR APPLICATION.

- NOTES:**
- REFER TO PIPING & SHEET METAL PLANS FOR LOCATIONS AND QUANTITY OF UNITS AND LOCATIONS OF ROOM TEMP SENSORS.
 - WHERE INDICATED ON FLOOR PLANS, SPACE TEMPERATURE SHALL BE REFERENCED TO MULTIPLE AIR TERMINAL UNIT CONTROLLERS VIA DDC NETWORK.
 - TC CONTRACTOR SHALL PROVIDE TERMINAL UNIT CONTROLLER, 24V POWER, NETWORK WIRING, SENSORS AND DEVICES AS SHOWN.
 - TERMINAL UNIT MANUFACTURER SHALL PROVIDE TERMINAL UNIT W/CONTROL DAMPER AND VELOCITY SENSOR FOR SYSTEM CONTROL. TC CONTRACTOR SHALL COORDINATE WITH TAB CONTRACTOR TO DETERMINE DAMPER CONTROL SETTINGS TO ACHIEVE SCHEDULED MINIMUM AND MAXIMUM CFMs.
 - TC CONTRACTOR SHALL FURNISH HW CONTROL VALVES FOR HEATING ELEMENTS PER THE MECHANICAL DETAILS. SELECT CONTROL VALVES TO ACHIEVE THE SCHEDULED FLOW RATES.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, AND DELAYS DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM (BAS) OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

- ALL TU'S ASSOCIATED WITH A SINGLE SPACE TEMP SENSOR SHALL CONTROL IN UNISON.
- SUPPLY AIR TERMINAL UNIT'S (TU) VAV MINIMUM AND MAXIMUM AIRFLOW SETTINGS SHALL BE AS INDICATED ON THE MECHANICAL SCHEDULES. WHERE MINIMUM AND MAXIMUM AIRFLOW SETTINGS ARE THE SAME, THE TU CONTROLLER SHALL PERFORM CONSTANT AIR VOLUME CONTROL.
- IN ALL MODES OF HEATING, TU DISCHARGE AIR TEMP SENSOR SHALL PROVIDE HIGH LIMIT SETPOINT CONTROL AT 90F DAT.
- WHEN SPACE TEMP RISES ABOVE THE SPACE COOLING SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL KEEP THE HW HTG COIL VALVE CLOSED AND SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS COOLING MINIMUM AND MAXIMUM SETTINGS TO MAINTAIN SPACE COOLING SETPOINT.
- WHEN SPACE TEMP FALLS BELOW SPACE HEATING SETPOINT, THE SUPPLY AIR TU CONTROLLER SHALL FIRST MODULATE TU DAMPER TOWARDS ITS MINIMUM HEATING AIRFLOW SETTING. WHEN AIRFLOW IS AT MINIMUM, CONTROLLER SHALL MODULATE HW HTG COIL VALVE TOWARDS OPEN TO MAINTAIN SPACE HEATING SETPOINT. IF SPACE TEMP IS BELOW SETPOINT WITH HW HTG COIL PROVIDING DAT HIGH LIMIT TEMPERATURE, THE SUPPLY AIR TU CONTROLLER SHALL MODULATE THE SUPPLY AIRFLOW BETWEEN ITS HEATING MINIMUM AND MAXIMUM SETTING TO MAINTAIN SPACE HEATING SETPOINT.
- SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
HEATING UNOCCUPIED SETPOINT = 62F
HEATING OCCUPIED SETPOINT = 70F
COOLING OCCUPIED SETPOINT = 75F
COOLING UNOCCUPIED SETPOINT = 80F
- DURING BUILDING UNOCCUPANCY, THE ASSOCIATED AIR HANDLER SHALL CYCLE AS REQUIRED TO MAINTAIN BUILDING SETBACK AND SETUP TEMP SETPOINTS.
- WHEN THE ASSOCIATED AIR HANDLER IS DEACTIVATED, THE TU HW HTG COIL VALVE SHALL REMAIN CLOSED.
- WHEN THE ASSOCIATED AIR HANDLER IS OPERATING IN OPTIMUM START, OR WARM-UP OR PURGE MODES, THE TU SHALL MAINTAIN ITS MAXIMUM HEATING/COOLING AIRFLOW SETTING UNTIL SPACE OCCUPIED HEATING/COOLING TEMPERATURE SETPOINT IS ACHIEVED.
- THE DDC TU CONTROLLER SHALL RECALIBRATE THE AIRFLOW SENSOR AND RESET FLOATING CONTROL DAMPER AND HW HTG CONTROL VALVE ACTUATORS ONCE A WEEK MINIMUM. THE RECALIBRATION AND RESET PROCESS SHALL OCCUR WHEN THE ASSOCIATED AIR HANDLER IS DEACTIVATED. IF THE ASSOCIATED AIR HANDLER OPERATES CONTINUOUSLY, THE RECALIBRATION AND RESET PROCESS SHALL BE STAGGERED AMONGST THE TERMINAL UNITS SO THE DUCT STATIC PRESSURE DOES NOT EXCEED LIMITS.
- DISCHARGE AIR TEMP SHALL BE MONITORED FOR SYSTEM DIAGNOSTICS AND PROVIDE HIGH LIMIT CONTROL AS DESCRIBED.
- CONTROL SIGNALS FOR AIR TERMINAL UNIT DAMPER ACTUATOR AND HEATING CONTROL OUTPUT(S) SHALL BE DISPLAYED WITH SYSTEM GRAPHICS.



ACU-6 W/ACCU CASSETTE UNIT CONTROL

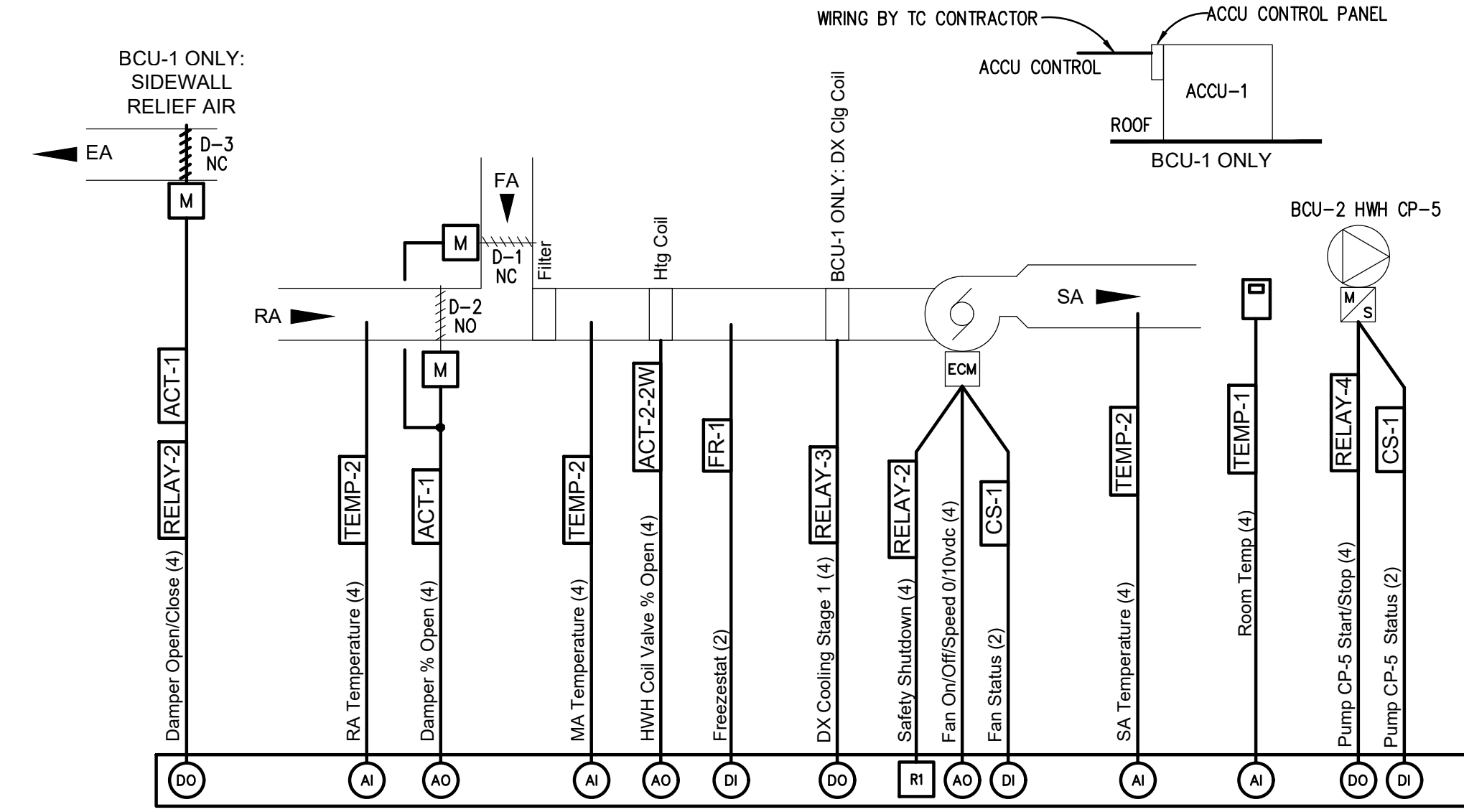
REFER TO PLANS FOR LOCATION

- NOTES:**
- DDC CONTROLLER SHALL PROVIDE SEQUENCE OF OPERATION HEREIN.
 - TC CONTRACTOR SHALL FURNISH CONTROL VALVE FOR HEATING COIL CONTROL AS SHOWN. SELECT 2-POSITION VALVE TO ACHIEVE THE SCHEDULED FLOW RATE AND PRESSURE DROP. CONTROL VALVE SHALL BE INSTALLED BY MECHANICAL CONTRACTOR AND WIRED TO ACU CONTROLLER BY TC CONTRACTOR.
 - ACU HAS INTERNAL FREEZESTAT FOR HWH COIL PROTECTION.
 - TC CONTRACTOR SHALL PROVIDE LOW VOLTAGE CONTROL FIELD WIRING BETWEEN INDOOR UNIT CONTROLS AND THE AIR-COOLED CONDENSING UNIT.
 - TC CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR TERMINATIONS AND WIRING REQUIREMENTS.

SEQUENCE OF OPERATION

ACU-6 CONTROL:
NOTE: ALL SETPOINTS, RESET SETPOINTS, DEADBANDS, AND TIME DELAYS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY BAS OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS.

- SUPPLY FAN (SF) SHALL HAVE START/STOP CAPABILITY FROM DDC/BAS AND SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE. TEMPORARY OCCUPIED MODE SET FOR 1-HR. WHEN ENABLED FROM OVERRIDE SWITCH ON TEMPERATURE SENSOR, AND UNOCCUPIED CYCLE MODE. IN OCCUPIED MODE, DDC SHALL RUN SF CONTINUOUSLY AND COMMAND OA DAMPER OPEN.
- FOR OCCUPIED HEATING MODE, DDC SHALL COMMAND ON/OFF HWH COIL VALVE TO MAINTAIN SPACE HEATING SETPOINT. DX COOLING CONTROL REMAINS OFF.
- FOR OCCUPIED COOLING MODE, DDC SHALL COMMAND ON/OFF DX COOLING CONTROL TO MAINTAIN SPACE COOLING SETPOINT. HWH COIL VALVE SHALL REMAIN CLOSED TO THE COIL.
- FOR UNOCCUPIED HEATING MODE, DDC SHALL CYCLE ACU SF ON AND COMMAND HWH COIL VALVE OPEN UNTIL SETPOINT IS REACHED. THEN DDC SHALL CYCLE ACU SF OFF. WHEN ACU IS OFF, COMMAND DX COOLING CONTROL OFF, & CLOSE HWH COIL VALVE TO THE COIL. OA DAMPER SHALL REMAIN CLOSED. DDC SHALL PROVIDE 2F DEADBAND FOR CONTROL.
- FOR UNOCCUPIED COOLING MODE, DDC SHALL CYCLE ACU SF ON AND COMMAND ON DX COOLING CONTROL UNTIL SETPOINT IS REACHED. THEN DDC SHALL CYCLE ACU SF OFF. WHEN ACU IS OFF, COMMAND DX COOLING CONTROL OFF, & CLOSE HWH COIL VALVE TO THE COIL. OA DAMPER SHALL REMAIN CLOSED. DDC SHALL PROVIDE 2F DEADBAND FOR CONTROL.
- WHEN ACU IS DEACTIVATED OR OPERATING IN MORNING WARM-UP MODE, OA DAMPER SHALL REMAIN CLOSED.
- SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
HEATING UNOCCUPIED SETPOINT = 62F
HEATING OCCUPIED SETPOINT = 70F
COOLING OCCUPIED SETPOINT = 75F
COOLING UNOCCUPIED SETPOINT = 80F
- WHEN ACU IS DEACTIVATED, SF AND DX COOLING SHALL BE OFF AND OA DAMPER CLOSED. WHEN OA TEMP IS BELOW 40F, HWH COIL VALVE SHALL BE OPENED 50% BY DDC.
- DDC SHALL NIGHT CYCLE THE ACU TO MAINTAIN UNOCCUPIED HEATING/COOLING SPACE TEMPERATURE SETPOINTS WITH ±2F DEADBAND FOR CONTROL. OA DAMPER SHALL REMAIN CLOSED.



BLOWER COIL UNIT CONTROL

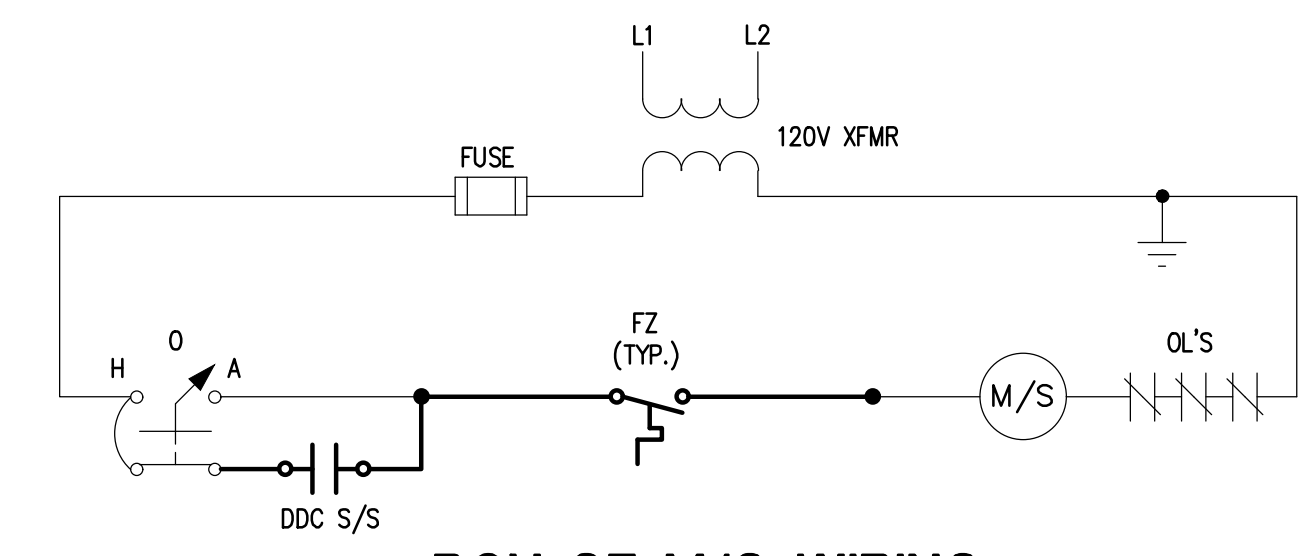
BCU-1
BCU-2 W/HWH CP-5

- NOTES:**
- TC CONTRACTOR SHALL PROVIDE FIELD WIRING AND INSTRUMENTATION TUBING FOR FIELD MOUNTED COMPONENTS. COORDINATE UNIT CONTROL TERMINATION REQUIREMENTS WITH BCU SUPPLIER. TC CONTRACTOR SHALL PROVIDE GUARDS FOR SPACE MOUNTED SENSORS.
 - TC CONTRACTOR SHALL PROVIDE BCU WITH LON DDC CONTROLLER USING LON COMMUNICATION FOR INTERFACE TO THE (E)BUILDING AUTOMATION SYSTEM (BAS) AND ALL CONTROLS, ACTUATORS, SENSORS, RELAYS, ETC. FOR UNIT UNLESS OTHERWISE NOTED.
 - INSTALL CURRENT SWITCHES ON MOTOR LEADS TO MONITOR FANS OR PUMP MOTOR STATUSES.
 - ALL DDC CONTROL POINTS (DO, DI, AO, AI) FOR UNIT CONTROL ARE WIRED TO FACTORY PROVIDED TERMINATION STRIP.
 - TAB CONTRACTOR SHALL PROVIDE ECM SPEED SETTINGS AFTER FINAL AIR BALANCE.
 - REFER TO EQUIPMENT SUPPLIER'S SUBMITTAL FOR DX COOLING STAGE COUNT AND/OR MODULATION CONTROL.

SEQUENCE OF OPERATION

NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN THE SEQUENCE OF OPERATION SHALL BE ADJUSTABLE BY BUILDING AUTOMATION SYSTEM OPERATORS. APPROPRIATE DEADBANDS SHALL BE USED TO PREVENT SHORT CYCLING SITUATIONS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

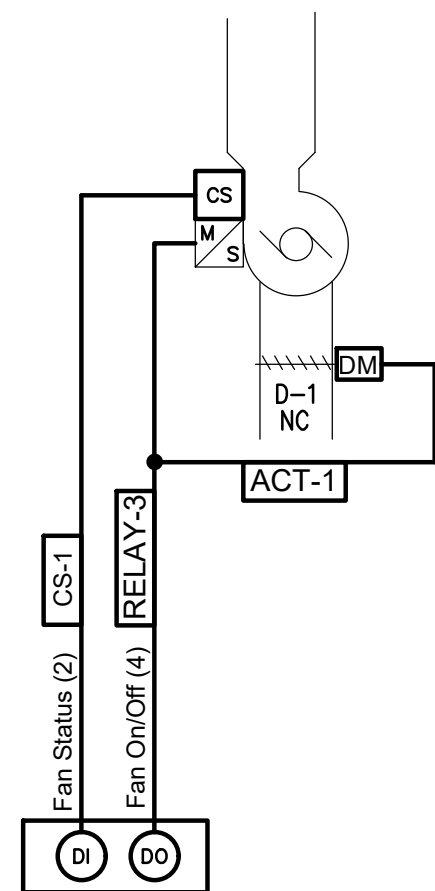
- SUPPLY FAN (SF) SHALL HAVE START/STOP CAPABILITY FROM THE BAS SYSTEM. BCU SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE COMPENSATED BY OPTIMUM START PROGRAM AND UNOCCUPIED CYCLE MODE. OPTIMUM START PROGRAM SHALL DETERMINE REQUIRED LEAD TIME TO ACHIEVE DESIRED ZONE TEMPERATURE AT BUILDING OCCUPANCY (BASED ON TRENDED DATA).
- SUPPLY FAN STATUS SHALL BE MONITORED BY DDC THRU CURRENT SWITCH. SF CURRENT SWITCH SHALL PROVIDE FEEDBACK TO ENABLE TEMPERATURE CONTROLS. ABNORMAL STATUS CONDITION FOR SF SHALL ACTIVATE ALARM.
- BCU-2 ONLY: DDC SHALL ACTIVATE HWH COIL CIRC PUMP WHENEVER OA TEMP IS BELOW 45F SETPOINT OR THERE IS A NEED FOR HEAT. PUMP STATUS SHALL BE MONITORED BY DDC THRU CURRENT SWITCH. ABNORMAL STATUS CONDITION SHALL ACTIVATE ALARM.
- WHEN BCU IS ACTIVATED DURING OCCUPIED MODE, OA AND RA DAMPERS (CALLED DAMPERS) SHALL BE POSITIONED AT MINIMUM OA. WHEN BCU IS DEACTIVATED OR OPERATING IN NIGHT CYCLE MODE OR MORNING WARM-UP MODE, RELIEF DAMPER AND DAMPERS SHALL REMAIN CLOSED TO OUTSIDE AIR.
- FOR BCU-1 & BCU-2: DDC SHALL PROVIDE DAT HIGH LIMIT SETPOINT OF 90F AND DAT LOW LIMIT SETPOINT OF 55F.
- BCU-2 (NO ECONOMIZER):
6.1. DDC SHALL POSITION DAMPERS AT MINIMUM OA AND MODULATE HWH COIL VALVE TO MAINTAIN SPACE HEATING TEMP SETPOINT.
7. BCU-1:
7.1. WHEN SPACE TEMP IS BELOW SPACE TEMP SETPOINT, DDC SHALL POSITION DAMPERS AT MINIMUM OA AND MODULATE HWH COIL VALVE TO MAINTAIN SPACE HEATING TEMP SETPOINT. DX COOLING CONTROL SHALL REMAIN OFF.
7.2. WHEN SPACE TEMP IS ABOVE SPACE TEMP SETPOINT, AND OA TEMPERATURE IS LESS THAN OR EQUAL TO 60F, DDC SHALL MODULATE DAMPERS ABOVE MINIMUM OA POSITION TO PROVIDE FREE COOLING AND MAINTAIN SPACE COOLING TEMP SETPOINT. HWH COIL VALVE SHALL REMAIN CLOSED TO THE COIL.
- WHEN FREE COOLING CANNOT MAINTAIN SPACE COOLING TEMP SETPOINT, DDC SHALL STAGE DX COOLING CONTROL TO MAINTAIN SPACE COOLING TEMP SETPOINT.
- IN FREE COOLING, WHEN DAMPERS ARE 50% OPEN OR MORE, DDC SHALL OPEN THE RELIEF DAMPER. WHEN DAMPERS ARE 35% OPEN OR LESS, DDC SHALL CLOSE THE RELIEF DAMPER.
- WHEN NOT IN ECONOMIZER, DDC SHALL POSITION DAMPERS AT MINIMUM OA AND STAGE DX COOLING CONTROL TO MAINTAIN SPACE COOLING TEMP SETPOINT. DDC SHALL CLOSE HWH COIL VALVE TO THE COIL.
- BCU-1 ONLY: DDC SHALL PROVIDE MIXED AIR LOW LIMIT OVERRIDE CONTROL OF DAMPERS WITH SETPOINT OF 54F. DDC SHALL MODULATE DAMPERS BELOW MINIMUM OA POSITION TO AS MUCH AS CLOSED TO MAINTAIN LOW LIMIT SETPOINT. DDC SHALL ACTIVATE "LOW LIMIT CONTROL" ALARM UPON THIS OPERATING CONDITION.
- BCU-2 ONLY: DDC SHALL PROVIDE MIXED AIR LOW LIMIT OVERRIDE CONTROL OF DAMPERS WITH SETPOINT OF 41F. DDC SHALL MODULATE DAMPERS BELOW MINIMUM OA POSITION TO AS MUCH AS CLOSED TO MAINTAIN LOW LIMIT SETPOINT. DDC SHALL ACTIVATE "LOW LIMIT CONTROL" ALARM UPON THIS OPERATING CONDITION.
- SPACE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS:
HEATING UNOCCUPIED SETPOINT = 62F
HEATING OCCUPIED SETPOINT = 70F
COOLING OCCUPIED SETPOINT = 75F
COOLING UNOCCUPIED SETPOINT = 80F
- FREEZESTAT AFTER HWH COIL SHALL DEACTIVATE SF WHEN SENSED TEMPERATURE IS 35F SETPOINT OR BELOW. SETPOINT IS ADJUSTABLE AT THE FREEZESTAT. FREEZESTAT SHALL BE MANUAL RESET TYPE. DDC SHALL PROVIDE AN ALARM FOR SAFETY TRIP.
- WHEN BCU IS DEACTIVATED, SF AND DX COOLING SHALL BE OFF. WHEN OA TEMP IS BELOW 40F, HWH COIL VALVE SHALL BE MODULATED BY DDC BASED ON DISCHARGE AIR TEMP TO MAINTAIN LOW LIMIT PLENUM TEMP SETPOINT OF 50F.
- DDC SHALL NIGHT CYCLE THE BCU TO MAINTAIN UNOCCUPIED TEMP SETPOINTS. RELIEF DAMPER AND DAMPERS SHALL REMAIN CLOSED TO OUTSIDE AIR. DDC SHALL PROVIDE 2F DEADBAND FOR CONTROL.



BCU SF M/S WIRING

GENERAL NOTES

GENERAL NOTES ON TC DRAWING M-801 APPLY TO THIS DRAWING.



EF-12 CONTROL

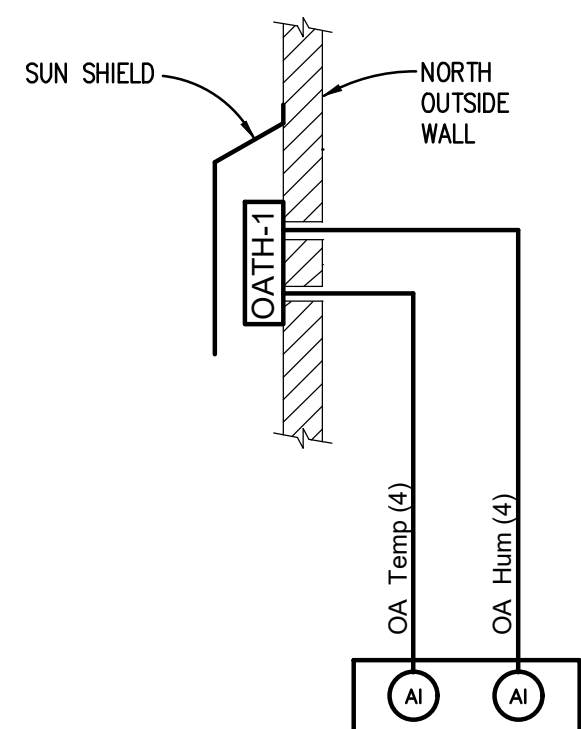
REFER TO PLANS FOR LOCATION

NOTES:

1. TC CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR TERMINATIONS AND WIRING REQUIREMENTS.

SEQUENCE OF OPERATION:

1. EXHAUST FAN (EF) SHALL HAVE START/STOP CAPABILITY FROM DDC/BAS AND SHALL OPERATE BASED ON BAS TIME OF DAY SCHEDULED OCCUPIED MODE AND SHALL NOT RUN IN UNOCCUPIED MODE. WHEN DDC ACTIVATES EF, DAMPER SHALL OPEN.
2. DDC SHALL TOTALIZE EF RUN TIME HOURS OF OPERATION AND PROVIDE FAN STATUS VIA CURRENT SWITCH FOR BAS DISPLAY.
3. WHEN DDC DEACTIVATES EF, DAMPER SHALL CLOSE.

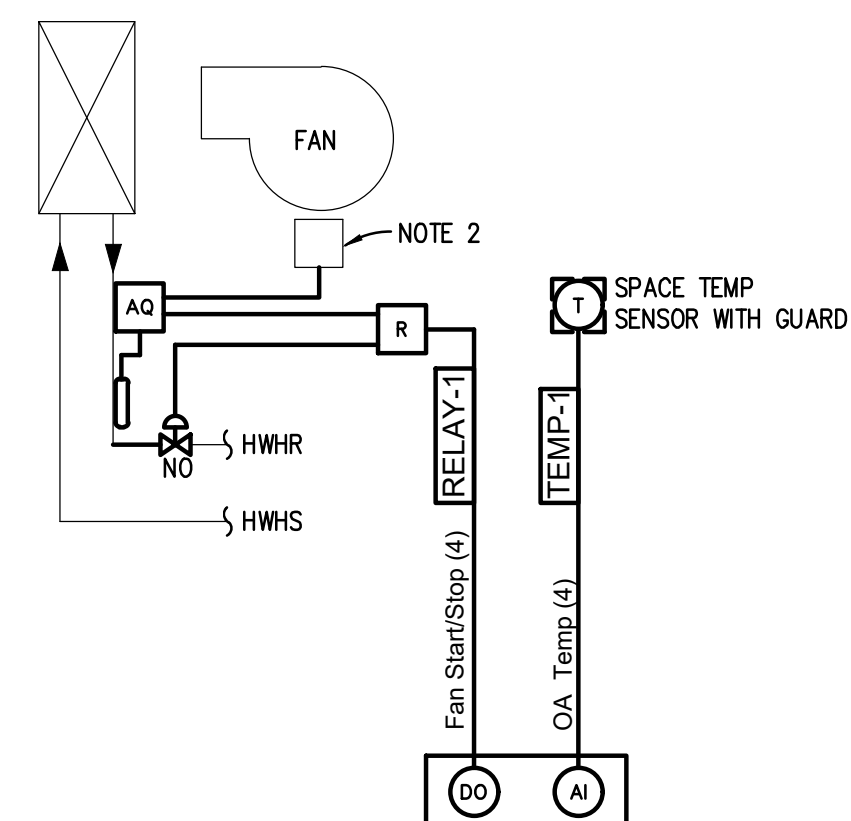
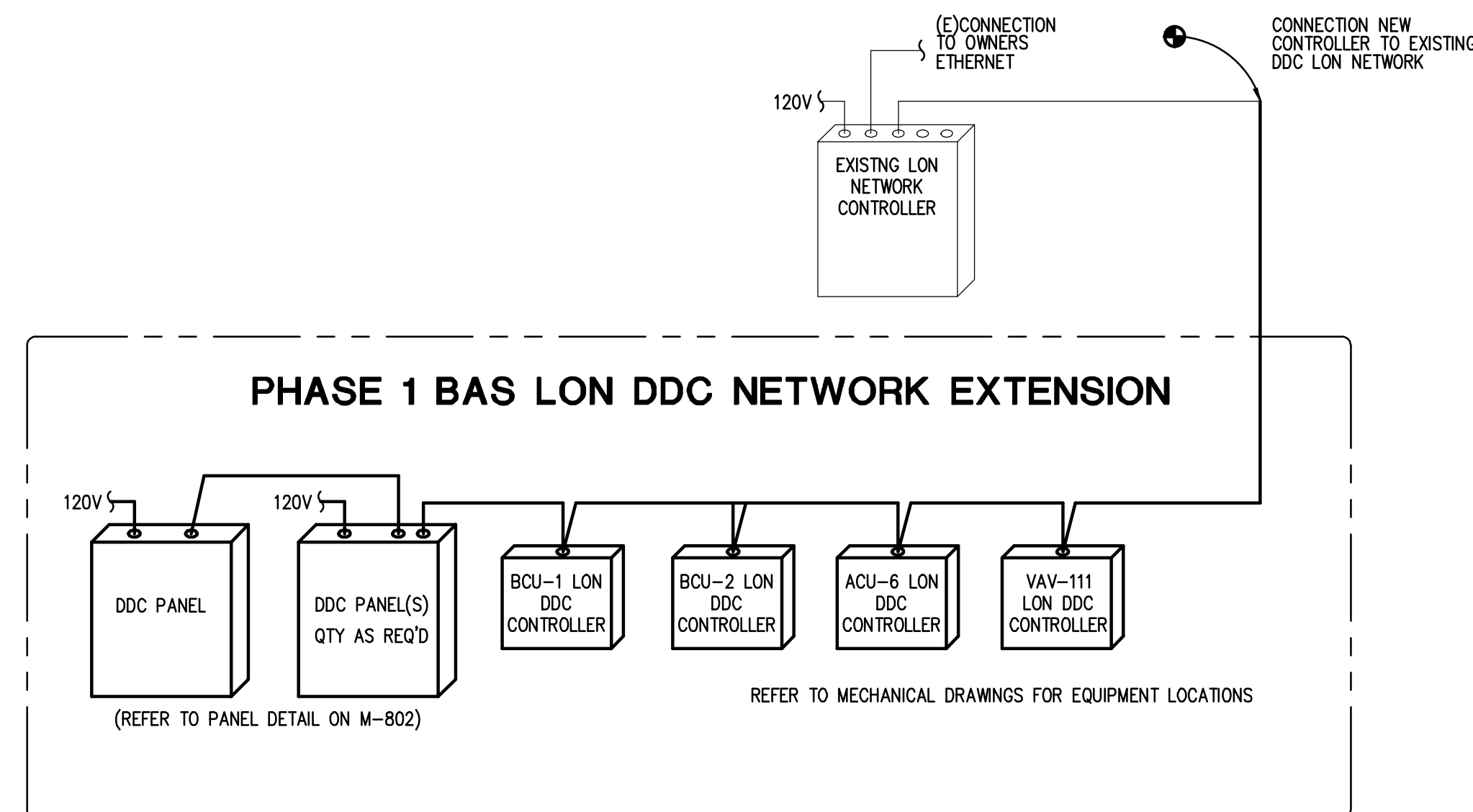


TYPICAL OA SENSOR DETAIL

NO SCALE

NOTES:

1. PROVIDE OA TEMP AND HUMIDITY SENSORS FOR BUILDING. MOUNT SENSORS ON NORTH SIDE OF THE BUILDING OR UNDER A SOFFIT IF ELSEWHERE.
2. CALCULATE OA ENTHALPY OR DEW POINT TEMPERATURE AS REQUIRED PER SEQUENCE OF OPERATION REQUIREMENTS.
3. BROADCAST OUTSIDE AIR TEMPERATURE, HUMIDITY, AND CALCULATED OA ENTHALPY OR DEW POINT TEMPERATURE, AS REQUIRED, THROUGH BAS COMMUNICATION NETWORK TO CONTROLLERS REQUIRING INFORMATION FOR DDC PROGRAMMING LOGIC.



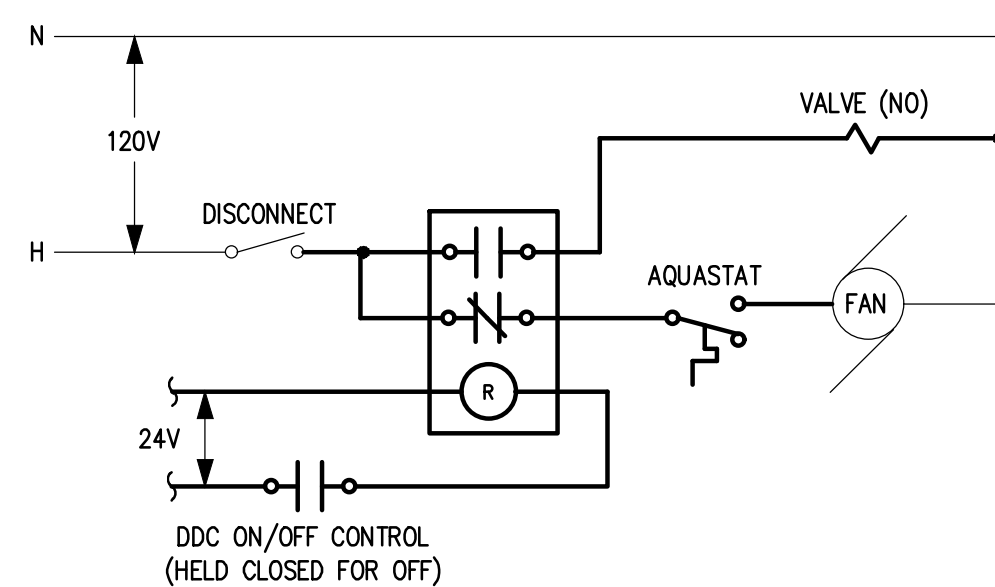
VESTIBULE CUH-7 CONTROL

SEQUENCE OF OPERATION:

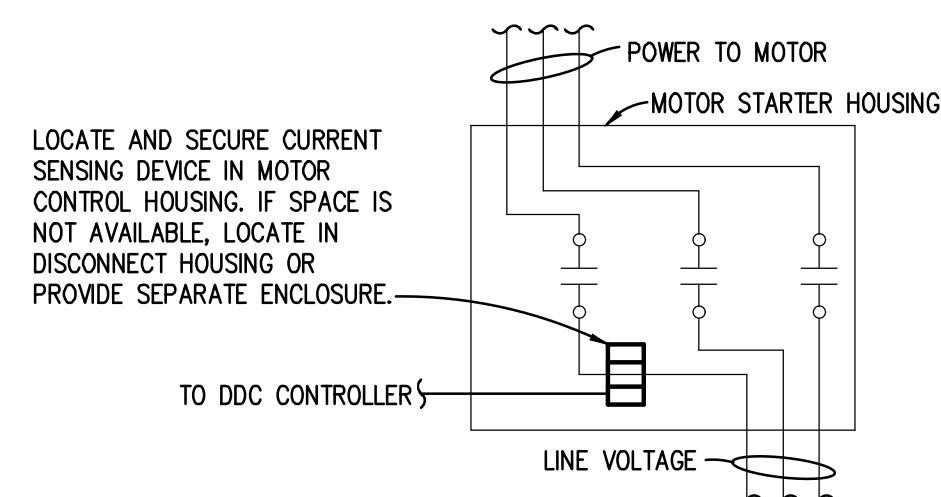
NOTE: ALL SETPOINTS, RESET SCHEDULE SETPOINTS, DEADBANDS, AND TIME INTERVALS DESCRIBED IN SEQUENCE SHALL BE ADJUSTABLE BY BAS OPERATORS. ALL MOTOR CONTROL SWITCHES SHALL BE IN "AUTO" POSITION.

1. STATE OF MICHIGAN - ASHRAE 90.1-2018 FOR VESTIBULES ONLY:

- 1.1. DDC SHALL ENABLE/DISABLE CUH FAN CIRCUIT AND OPEN/CLOSE HWV VALVE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE SETPOINT OF 60F. FAN SHALL ACTIVATE UPON PROOF OF HWHR FLOW BY AQUASTAT. AQUASTAT SHALL PROVIDE 4F DEADBAND FOR CONTROL. DDC SHALL PROVIDE 1.5F DEADBAND FOR CONTROL.
- 1.2. WHEN OUTSIDE AIR TEMPERATURE INCREASES ABOVE 45F, DDC SHALL DISABLE CONTROL OF THE CUH.



VESTIBULE CUH-7 WIRING

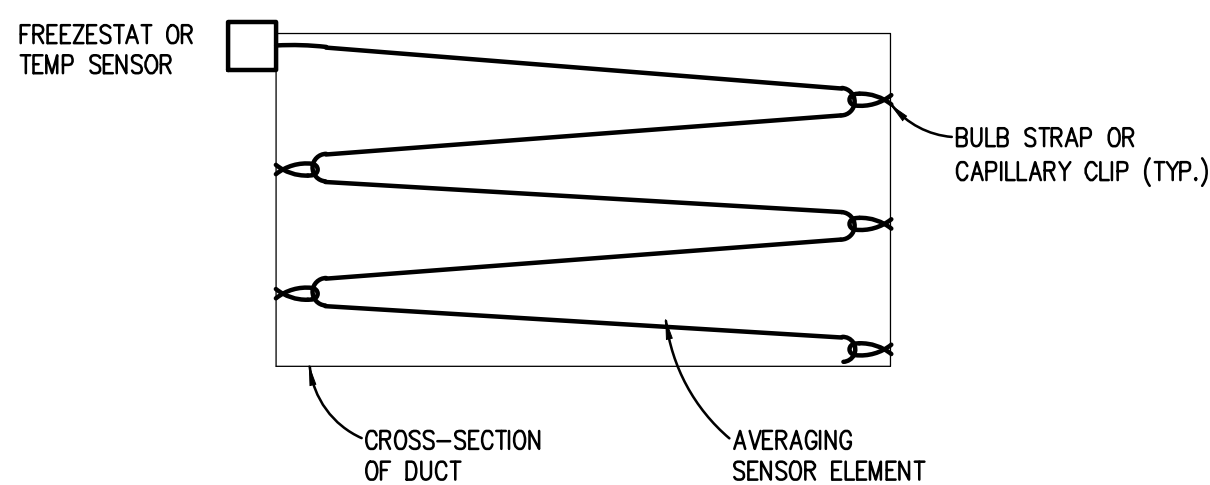


TYPICAL CURRENT SWITCH DETAIL

TYPICAL

NOTES:

1. WHERE INDICATED ON CONTROL DETAILS, CURRENT SWITCH SHALL BE INSTALLED FOR DDC SYSTEM STATUS INDICATION OF FAN OR PUMP OPERATION. APPROPRIATE TIME DELAY FOR STATUS FEEDBACK UPON DDC START AND STOP COMMANDS SHALL BE INCLUDED WITH THE DDC LOGIC TO AVOID NUISANCE OPERATIONAL ALARMS.
2. AS APPLICABLE, CURRENT SWITCH SHALL BE ADJUSTED TO MEET THE CURRENT DRAW REQUIRED TO DETECT FAN BELT LOSS, PUMP COUPLING DETACHMENT, OR VFC LOSS.
3. WHEN FAN OR PUMP IS ON AND NOT IN ALARM, DDC SYSTEM SHALL TOTALIZE RUN TIME HOURS FOR OPERATOR INFORMATION FROM BUILDING AUTOMATION SYSTEM OPERATOR INTERFACE.

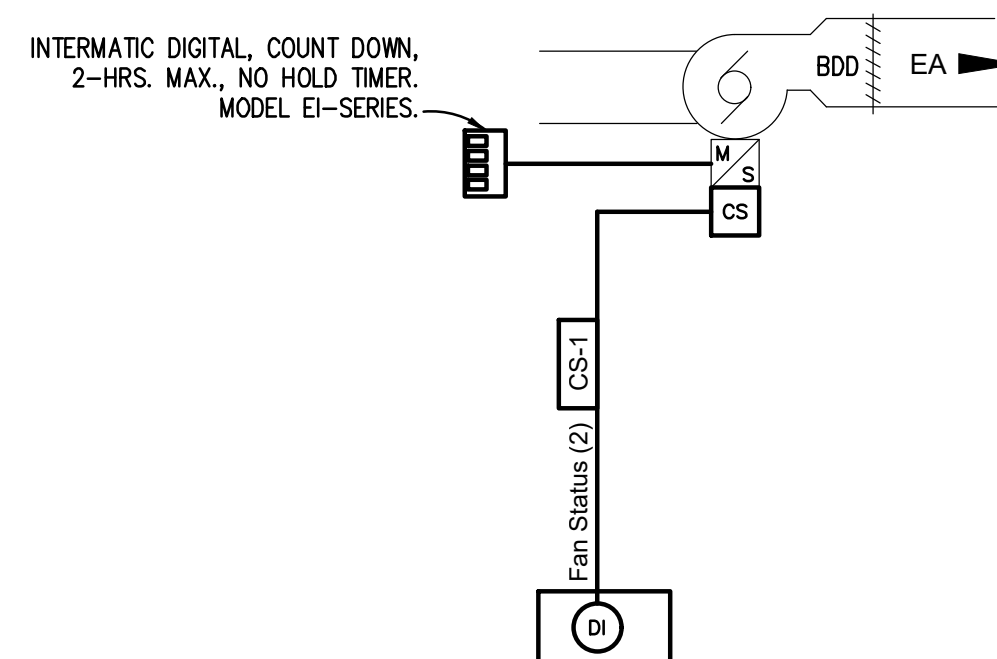


AVERAGING ELEMENT INSTALLATION DETAIL

TYPICAL

NOTES:

1. FREEZE/STAT QUANTITY SHALL BE ONE PER 20 SQ. FT. OF CROSS-SECTIONAL AREA.
2. AVERAGING DDC SENSOR QUANTITY SHALL BE SUFFICIENT TO COVER AND SENSE THE CROSS-SECTIONAL AREA.
3. PROVIDE REQUIRED CAPILLARY STRAP OR CLIPS TO SUPPORT SENSOR TO PREVENT VIBRATION FROM AIR MOVEMENT.
4. PROVIDE PROTECTION AT EACH CAPILLARY STRAP OR CLIP TO PREVENT ABRASION TO CAPILLARY.



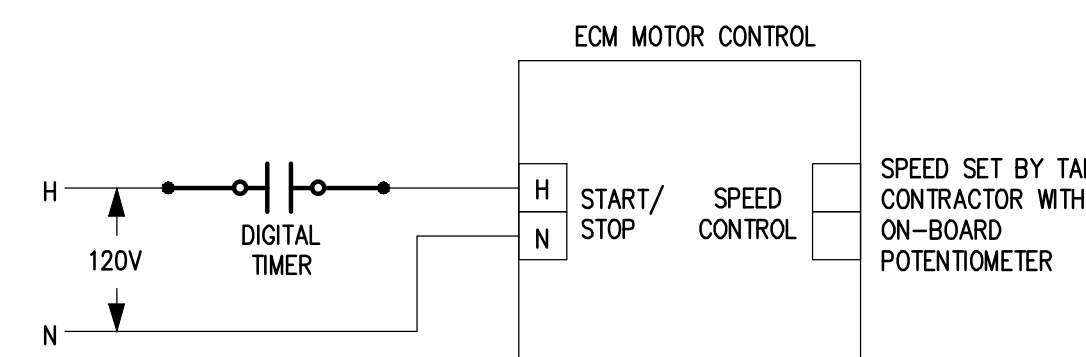
VENT FAN VF-3 CONTROL

NOTES:

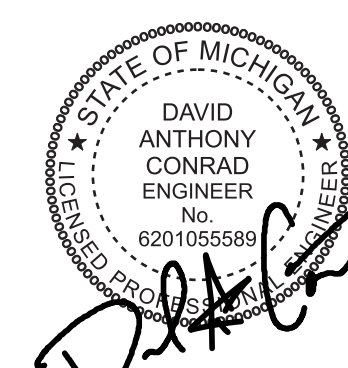
1. TC CONTRACTOR SHALL COORDINATE WITH MANUFACTURER FOR TERMINATIONS AND WIRING REQUIREMENTS.

SEQUENCE OF OPERATION:

1. VENT FAN (VF) SHALL HAVE START/STOP CAPABILITY FROM DIGITAL TIMER. WHEN SPACE USER ACTIVATES VF VIA MANUAL DIGITAL TIMER, FAN SHALL RUN.
2. WHEN TIMER PERIOD EXPIRES, FAN SHALL STOP.
3. DDC SHALL DISPLAY VENT FAN STATUS AT BAS AND TOTALIZE RUN TIME HOURS OF OPERATION.



VENT FAN VF-3 ECM WIRING

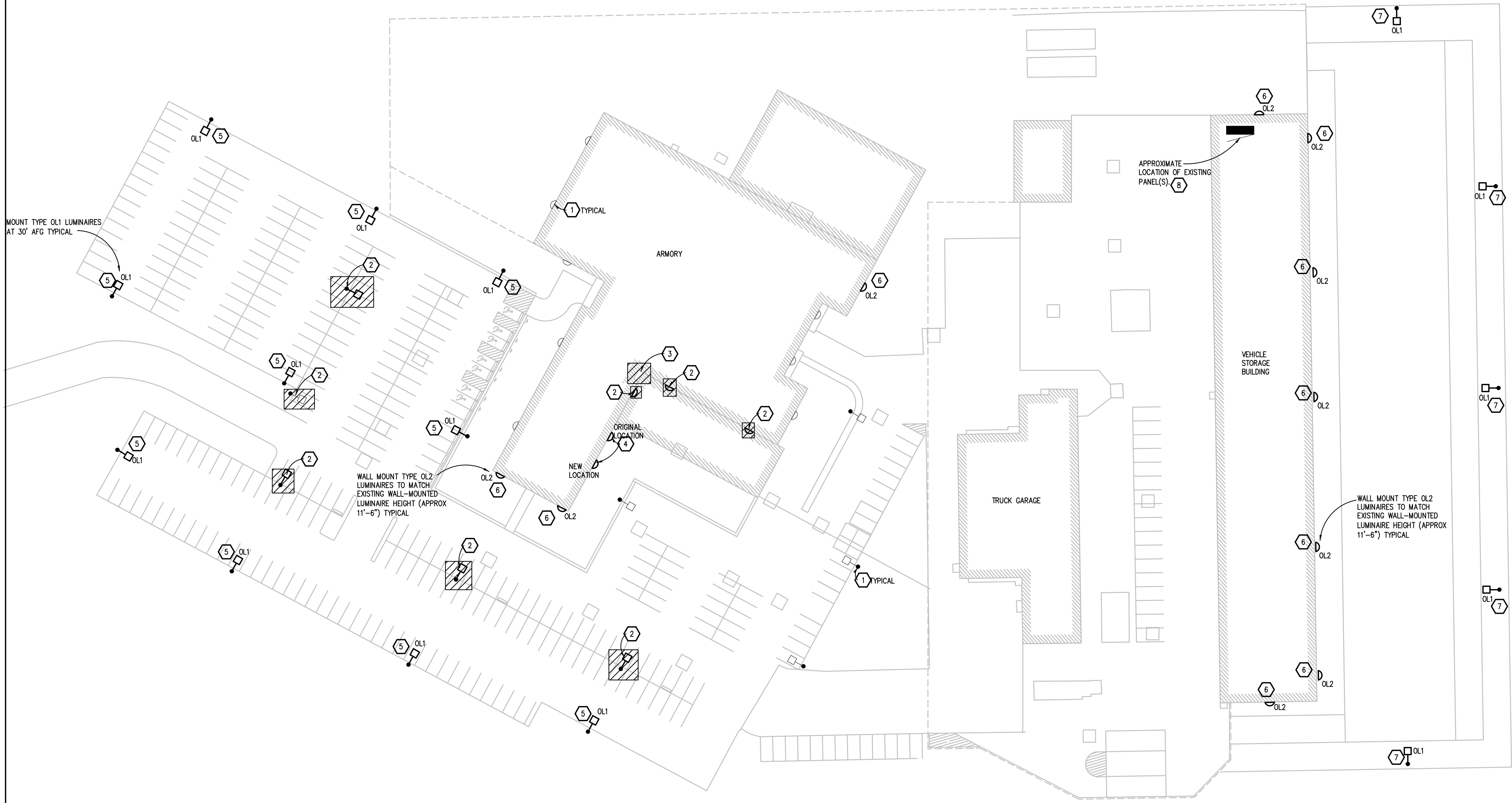


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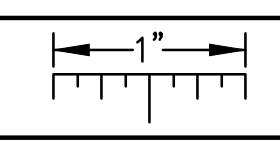
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	FORBES		816 E 4th ST. 48067 248.842.7666/www.pba.com												

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ELECTRICAL NEW WORK SITE PLAN
SCALE: 1" = 40'



THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

SITE PLAN GENERAL NOTES:

1. THESE NOTES ARE GENERIC GUIDELINES ONLY. ELECTRICAL CONTRACTOR'S PERSONNEL ON SITE SHALL BE THOROUGHLY FAMILIAR WITH THE PUBLISHED SPECIFICATIONS FOR EXACT DESCRIPTIONS OF SCOPE, METHODS, AND MATERIAL.
2. THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
3. CONDUCT A SURVEY TO IDENTIFY ALL UNDERGROUND UTILITIES. CALL 811 PRIOR TO EXCAVATION.
4. UTILITIES SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. COORDINATE EXACT LOCATION OF ALL EXISTING UTILITIES, AND ROUTING OF ALL NEW UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
5. DEWATER TRENCHES PRIOR TO INSTALLATION OF CONDUITS. PROVIDE WATER TIGHT FITTINGS ON ALL UNDERGROUND CONDUITS.
6. COORDINATE DEMOLITION WORK, AND ELECTRICAL AND TELEPHONE SERVICES TO THE SITE, WITH THE RESPECTIVE LOCAL UTILITY COMPANY REPRESENTATIVES PRIOR TO COMMENCEMENT OF WORK. INCLUDE ALL ASSOCIATED COST/FEE'S BY THE UTILITY COMPANIES IN THE BID PRICE.
7. INSTALL UNDERGROUND CONDUITS 42" BELOW FINISHED GRADE, MINIMUM, UNLESS NOTED OTHERWISE.
8. COORDINATE SERVICE SHUT-DOWNS WITH ALL TRADES INVOLVED ON SITE AND OBTAIN WRITTEN AUTHORIZATION FROM OWNER 72 HOURS PRIOR TO ANY ELECTRICAL AND/OR TELEPHONE SHUT-DOWN.
9. REMOVE ALL DE-ENERGIZED CONDUCTORS FROM SITE AT COMPLETION OF THE PROJECT.
10. OUTDOOR LIGHTING BRANCH CIRCUIT WIRING SHALL BE MINIMUM #8 AWG CONDUCTORS (XHHW-2), IN MINIMUM 1" DIA. CONDUIT, UNLESS NOTED OTHERWISE.
11. SPARE CONDUITS SHALL INCLUDE PULL STRING AND SHALL BE TERMINATED WITH A CAP.
12. EXCAVATE THE ENTIRE LENGTH OF TRENCH TO PROPERLY SET DUCT ELEVATIONS.

CONSTRUCTION KEY NOTES:

1. EXISTING EXTERIOR LIGHTING FIXTURES, LIGHTING POLES, CONTROLS, AND ELECTRICAL DEVICES, AND WIRING TO REMAIN UNLESS OTHERWISE INDICATED.
2. DISCONNECT AND REMOVE MOUNTED LIGHT FIXTURES, POLE MOUNTED LIGHTING FIXTURES, POLES, AND BASES WHERE INDICATED.
3. DISCONNECT AND REMOVE LIGHTING FIXTURES, RECEPTACLE, SECURITY DEVICES AND OTHER ELECTRICAL AND AUXILIARY SYSTEM DEVICES IN EXTERIOR ENTRY. REMOVE WIRING BACK TO SOURCE OR NEXT DEVICE TO REMAIN OPERATIONAL.
4. RELOCATED BUILDING MOUNTED LIGHTING FIXTURE. MAINTAIN CIRCUITING AND CONTROLS. EXTEND CONDUIT AND WIRE AS REQUIRED TO NEW LOCATION.
5. CONNECT TO EXISTING EXTERIOR LIGHTING FIXTURE CIRCUIT FOR EXISTING POLE MOUNTED FIXTURES- ROUTE 2#6 & 1 # 10 GROUND IN 1 1/4" CONDUIT BETWEEN FIXTURES INDICATED AND PANEL BREAKER. CONTROL BY INTEGRAL FIXTURE PHOTOCELL.
6. CONNECT TO EXISTING EXTERIOR LIGHTING FIXTURE CIRCUIT FOR EXTERIOR WALL MTD LIGHTING AT VEHICLE STORAGE BUILDING - VERIFY EXISTING CIRCUIT AND PANEL LOCATION IN FIELD. CONTROL BY INTEGRAL PHOTOCELL.
7. CONNECT EXTERIOR POLE MOUNTED FIXTURES TO NEW EXTERIOR LIGHTING FIXTURE CIRCUIT AT VEHICLE STORAGE BUILDING (120V, 20A CIRCUIT - COORDINATE FEEDER SIZE FOR VOLT LOSS). PROVIDE NEW 20A-1P BREAKER AS REQUIRED - VERIFY EXISTING CIRCUITS AND PANEL LOCATION IN FIELD. CONTROL BY INTEGRAL PHOTOCELL.
8. VERIFY EXISTING ELECTRICAL PANEL LOCATIONS, VOLTAGE, AND CAPACITY IN FIELD. PROVIDE 30 DAY METERING PER NATIONAL ELECTRICAL CODE TO DETERMINE EXISTING LOAD FOR ADDITION OF NEW FIXTURES.



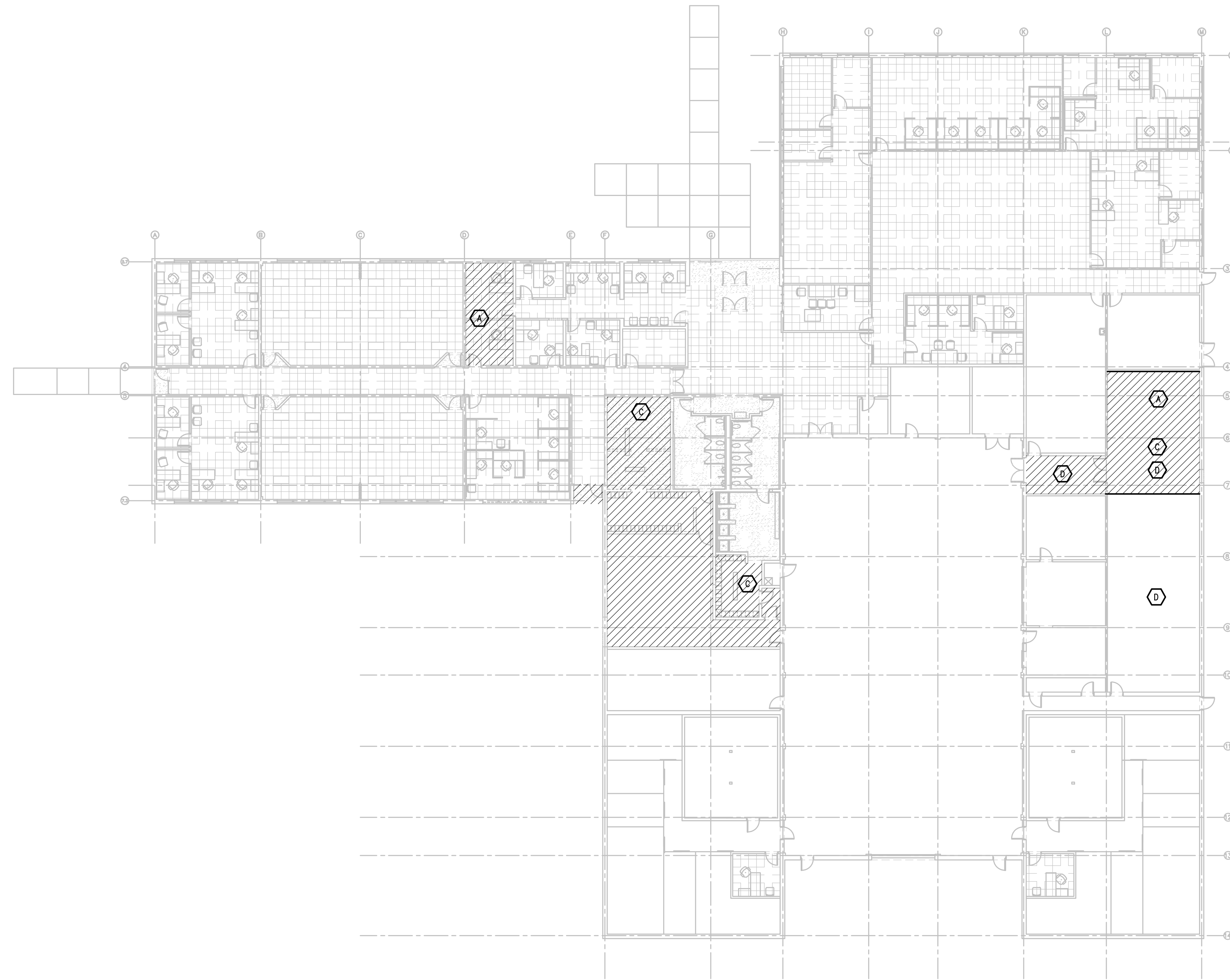
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FSA Project No. 0021206

DRAWING NUMBER	E-003
	DRAWING TITLE
ELECTRICAL NEW WORK SITE PLAN	SHEET NUMBER
87 OF 96	ISSUED FOR
CONSTRUCTION DOCUMENTS	DATE
04/01/2022	DESIGNED
APPROVED SAG	PROJECT
RENOVATE ARMORY WASHTEWAW ARMORY	PROJECT IDENTIFICATION NUMBER
CONTRACT NUMBER: Y21465	CONTRACT NUMBER: Y21465
FILE NO. 511/21326.CAK	FILE NO. 511/21326.CAK
DMA PROJECT NO. 2463802016	DMA PROJECT NO. 2463802016

STATE OF MICHIGAN
DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION
DESIGN AND CONSTRUCTION DIVISION
ADAM P. LACH, RA, DIRECTOR

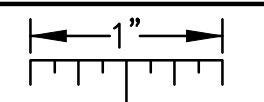
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DEMOLITION LIGHTING PLAN
SCALE 1/16" = 1'-0"

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



ELECTRICAL DEMOLITION GENERAL NOTES:

- VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
- EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
- REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
- COORDINATE WITH NEW WORK PLANS, ONE LINE DIAGRAMS AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
- PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
- REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
- MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
- DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
- PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED BUT EXISTING WALLS REMAIN INTACT.
- RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
- PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.
- VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
- COORDINATE ANY SHUT DOWN OF EXISTING SERVICES AND EQUIPMENT THAT ARE REMAINING IN USE WITH THE OWNER'S REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWNS MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER 72 HOURS PRIOR TO SHUT DOWN.

DEMOLITION KEY NOTES:

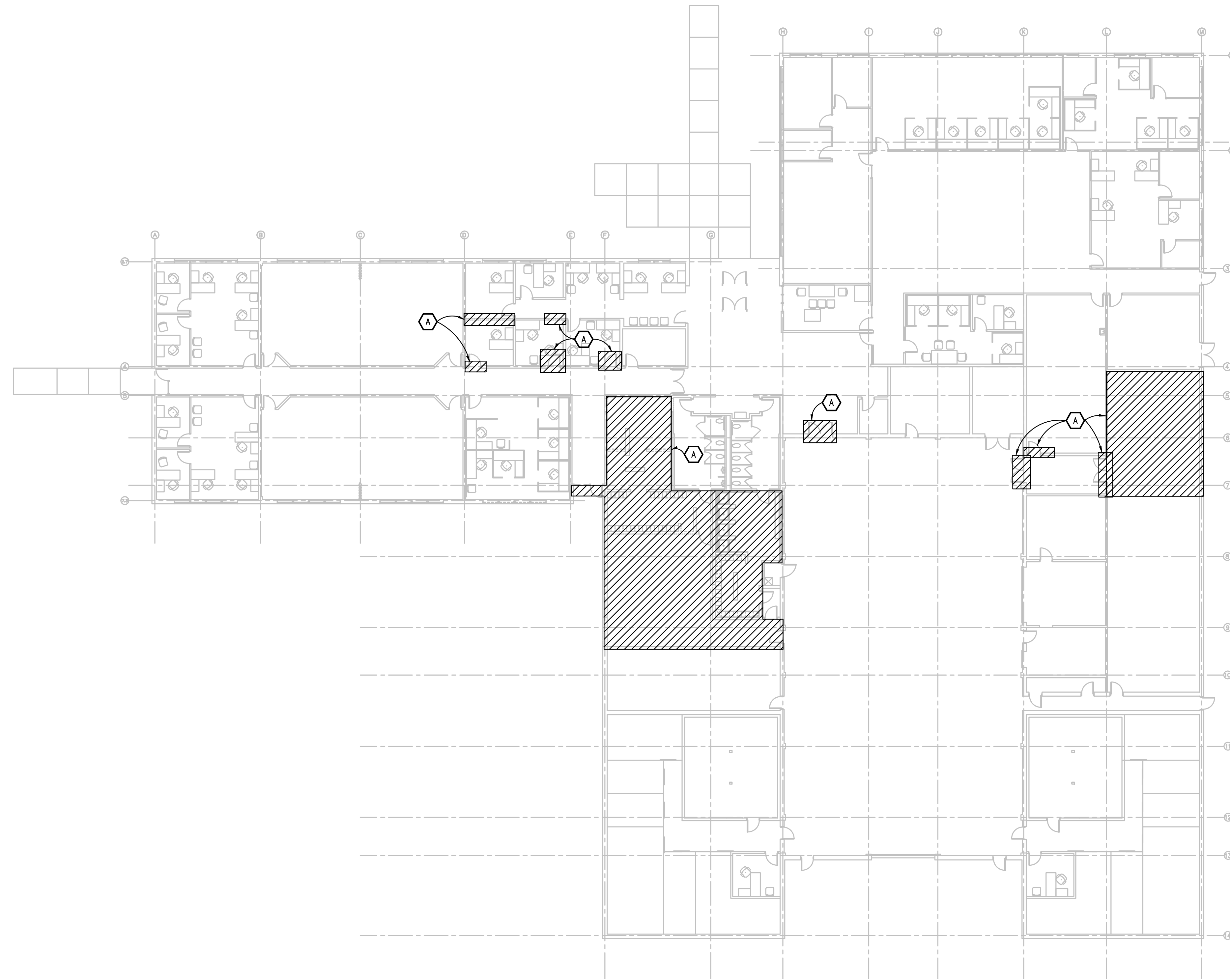
- REMOVE EXISTING LIGHTING IN SUCH A WAY THAT ALLOWS REUSE OF THE LUMINAIRES ELSEWHERE.
- REMOVE EXISTING LIGHTING AND RE-INSTALL IN NEW LOCATIONS AS SHOWN ON LIGHTING PLAN.
- IN AREAS WHERE LIGHTING DEMO OCCURS ADJACENT TO NON-DEMO AREAS WITH A CONTINUOUS CEILING, BE SURE THAT DEMO & REBUILD ARE DONE IN SUCH A WAY TO ENSURE THAT NEW CEILING & LIGHTING BLENDS SEAMLESSLY WITH EXISTING SYSTEMS.
- EXISTING LIGHTING CONTROLS IN THIS AREA WILL BE CHANGED TO ACCOMMODATE NEW LIGHTING.

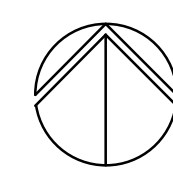
STATE OF MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET PROCUREMENT AND REAL ESTATE SERVICES ADMINISTRATION DESIGN AND CONSTRUCTION DIVISION ADAM P. LACH, RA, DIRECTOR	
816 E 4th St. 48067 248.642.7666/www.pba.com	
PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
DESIGNED	DRAWN SWM CHECKED SAM APPROVED SAG
DATE	04/01/2022
ISSUED FOR	CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21465 FILE NO. 511/21326.CAK DMA PROJECT NO. 2658022016
SHEET NUMBER	88 OF 96
DRAWING TITLE	DEMOLITION LIGHTING PLAN
DRAWING NUMBER	ED-201



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 **DEMOLITION POWER AND AUXILIARY SYSTEMS PLAN**
SCALE 1/16" = 1'-0"

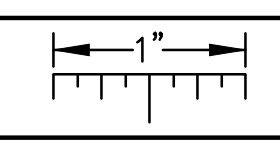
ELECTRICAL DEMOLITION GENERAL NOTES:

1. VISIT THE SITE PRIOR TO SUBMISSION OF BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
2. EXAMINE THE DRAWINGS OF OTHER TRADES AND BE FAMILIAR WITH THE DEMOLITION REQUIRED BY OTHER TRADES. PERFORM ALL INCIDENTAL ELECTRICAL DEMOLITION AND/OR RELOCATION REQUIRED TO FACILITATE THE DEMOLITION WORK OF OTHER TRADES, WHETHER OR NOT SPECIFICALLY INDICATED.
3. REMOVE EQUIPMENT OR MATERIALS AS INDICATED ON PLAN WITH CROSS HATCHING. DEMOLITION SHALL INCLUDE, BUT NOT BE LIMITED TO, THOSE COMPONENTS SHOWN.
4. COORDINATE WITH NEW WORK PLANS, ONE LINE DIAGRAMS AND RISER DIAGRAMS FOR EXTENT OF DEMOLITION WORK.
5. PROVIDE PROPER SUPPORT FOR EXISTING TO REMAIN CONDUITS AND BOXES WHERE EXISTING SUPPORT IS TO BE REMOVED. RE-ROUTE BRANCH CIRCUIT CONDUITS AND RELOCATE JUNCTION BOXES AS REQUIRED TO FACILITATE INSTALLATION OF NEW EQUIPMENT AND SYSTEMS IN CEILING SPACES.
6. REMOVE ALL CONDUIT AND WIRE BACK TO THE SOURCE OR NEAREST UPSTREAM DEVICE REMAINING IN SERVICE.
7. MAINTAIN ELECTRICAL SERVICE TO ALL LIGHTING FIXTURES, DEVICES AND EQUIPMENT THAT ARE TO REMAIN. EXTEND CONDUIT AND WIRE AS REQUIRED WHERE DEMOLITION WORK AFFECTS ELECTRICAL SERVICE TO DOWNSTREAM LOADS THAT ARE TO REMAIN.
8. DISPOSE OF ALL MATERIALS OFF SITE AND INCLUDE ALL COSTS FOR DISPOSAL IN BID. ALL MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, INCLUDING TCLP TESTING, PROPER DISPOSAL AND/OR RECYCLING OF FLUORESCENT LAMPS.
9. PROVIDE BLANK COVER PLATES WHERE SWITCHES AND DEVICES ARE REMOVED BUT EXISTING WALLS REMAIN INTACT.
10. RING OUT AND TAG ALL CIRCUITS AFFECTED BY THIS ALTERATION AT BOTH ENDS. MARK ALL UNUSED CIRCUIT BREAKERS "SPARE".
11. PROVIDE UPDATED TYPED-IN DIRECTORIES FOR ALL PANELS AFFECTED BY THIS ALTERATION.
12. VERIFY ALL UNDERGROUND AND IN SLAB UTILITY LOCATIONS PRIOR TO SAW-CUTTING OR PENETRATING ANY FLOOR SLAB.
13. COORDINATE ANY SHUT DOWN OF EXISTING SERVICES AND EQUIPMENT THAT ARE REMAINING IN USE WITH THE OWNER'S REPRESENTATIVE. WHERE EXISTING BUILDING SERVICE IS REQUIRED TO BE SHUT DOWN, INCLUDE ALL ASSOCIATED OVERTIME COSTS TO PERFORM THIS WORK DURING WEEKENDS AND EVENINGS INCLUDE ALL COSTS FOR PROVIDING TEMPORARY POWER WHERE SHUT DOWNS MUST OCCUR FOR PERIODS LONGER THAN THESE HOURS. COORDINATE ELECTRICAL SHUT DOWNS WITH THE OWNER 72 HOURS PRIOR TO SHUT DOWN.

DEMOLITION KEY NOTES:

- A. PARTICULAR CROSSHATCHING INDICATES AREA OF DEMOLITION. DISCONNECT AND REMOVE ELECTRICAL DEVICES, EQUIPMENT, TELECOMMUNICATIONS, FIRE ALARM, SECURITY AND OTHER AUXILIARY SYSTEM DEVICES FROM INDICATED AREA. REMOVE CONDUIT AND WIRING BACK TO SOURCE PANEL OR NEXT DEVICE TO REMAIN OPERATIONAL.

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.



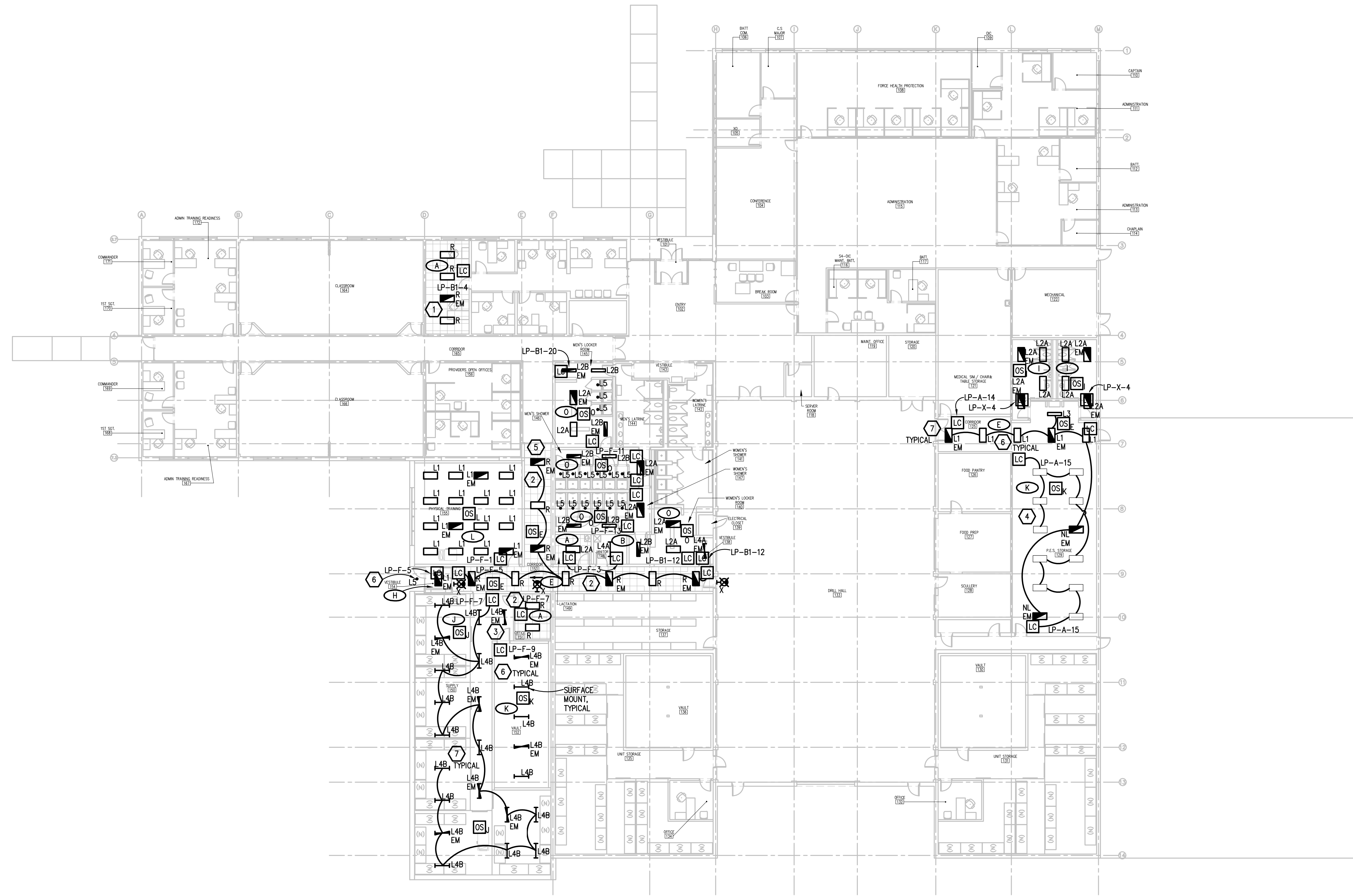

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ED-301	DRAWING NUMBER	DRAWING TITLE	SHEET NUMBER	ISSUED FOR	DATE	DESIGNED	PROJECT
ED-301	DEMOLITION POWER AND AUXILIARY SYSTEMS PLAN	89 OF 96	CONSTRUCTION DOCUMENTS	04/01/2022	DRAWN: SAM CHECKED: SAM APPROVED: SAC	RENOVATE ARMORY ARMORY	ARMORY WASHTEAW ARMORY
						PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y21465 FILE NO. 511/21326.CAK DWG PROJECT NO. 2483802016	

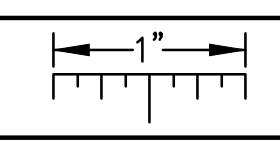
STATE OF MICHIGAN
 DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET
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DESIGN AND CONSTRUCTION DIVISION
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FORBES
 FINANCIAL ADMINISTRATION

9:\2021\2021-0363-00\CAD\2021-0363-E2-LP.dwg, E-201, 3/25/2022 2:12:37 PM, Devin J. Senechal, Peter Basso Associates Inc.



LIGHTING PLAN
SCALE 1/8" = 1'-0"



THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

ELECTRICAL GENERAL NOTES:

- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS. COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- COORDINATE AND PROVIDE ACCESS DOORS WITH INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
- TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
- MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
- COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
- COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
- REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
- REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
- REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
- ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH THE EXISTING FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTION SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT THE COMPLETION OF THE PROJECT.
- HOLD A PRE-CONSTRUCTION/PRE-ROUGH MEETING FOR WORK RELATED TO THE INTRUSION DETECTION SYSTEM (IDS). INCLUDE OWNER, GENERAL CONTRACTOR, ELECTRICAL SUBCONTRACTOR, DMVA IDS TECHNICIAN, AND OTHER PERSONNEL FOR COORDINATION OF SYSTEM REQUIREMENTS, INSTALLATION, AND OTHER RELATED WORK.

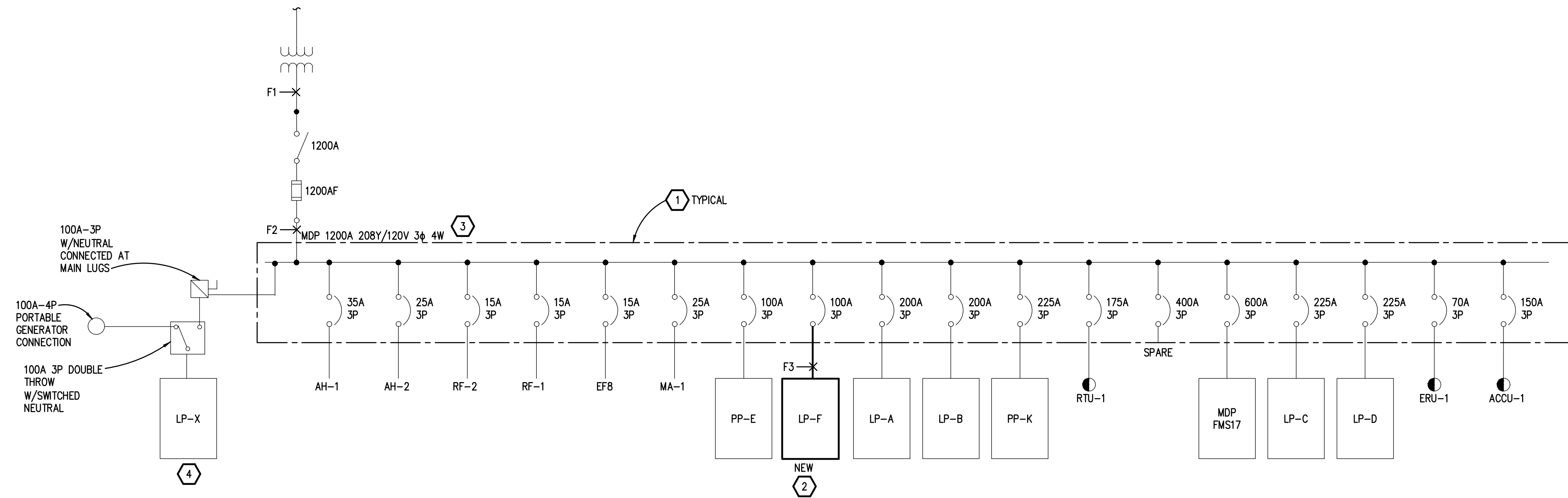
CONSTRUCTION KEY NOTES:

- REMOVE EXISTING LIGHTING (FIXTURE TYPE R) AND RE-INSTALL IN NEW LOCATIONS.
- INSTALL EXISTING LUMINAIRES THAT WERE REMOVED DURING DEMO TO BE REUSED IN NEW LOCATIONS (FIXTURE TYPE R).
- TYPE L4B-EM LUMINAIRE LOCATED JUST OUTSIDE OF THE VAULT TO BE WIRED TO BE ON 24/7 AND UNSWITCHED.
- RE-CIRCUIT EXISTING LIGHTING AS SHOWN.
- CORRIDOR LIGHTING CONTROL TO BE COORDINATED WITH CONTROL FOR EXISTING LIGHTING IN ADJACENT/EXTENDED CORRIDOR.
- PANEL & CIRCUIT NUMBERS FOR THE LIGHTING IN EACH EXISTING SPACE HAVE BEEN CALLED OUT BASED ON EXISTING/AS-BUILT DRAWINGS. VERIFY IN FIELD ACTUAL EXISTING CIRCUIT(S).
- LUMINAIRES DESIGNATED FOR EMERGENCY LIGHTING OPERATION TO BE CONNECTED TO SIGNTEX EXTERNAL BATTERY SYSTEM. ELECTRICAL CONTRACTOR TO DETERMINE AND PROVIDE ANY NECESSARY MATERIALS FOR CONNECTING TO THIS SYSTEM. VERIFY SIGNTEX CIRCUIT CAPACITY AND ADJUST AS REQUIRED. SEE ELECTRICAL POWER PLAN SHEET E-301 FOR EXISTING SIGNTEX BATTERY UNIT LOCATIONS.
- CONNECT TO EXISTING EXTERIOR LIGHTING FIXTURE CIRCUIT FOR EXTERIOR WALL MTD LIGHTING, CONTROL BY REMOTE PHOTOCELL.

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816 E 4th St. 48067 248.642.7666/www.pba.com	
PROJECT	RENOVATE ARMORY WASHENAW ARMORY
DESIGNED	SWM
DRAWN	CHECKED
DATE	04/01/2022
ISSUED FOR	CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER	PROJECT: WASHENAW ARMORY CONTRACT NUMBER: 121466 FILE NO. 511/21326.0AK DMVA PROJECT NO. 2658022016
SHEET NUMBER	90 OF 96
DRAWING TITLE	LIGHTING PLAN
DRAWING NUMBER	E-201



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DEMAND LOAD SUMMARY (208V, 3PH)

	KVA	AMPS
LTG REMOVED	0.42	
LTG ADDED	7.00	
RECEPTS REMOVED	3.06	
RECEPTS ADDED	4.32	
MECH REMOVED	0	
MECH ADDED	26.1	
MISC REMOVED	0.8	
MISC ADDED	2.24	
TOTAL REMOVED	4.28	11.9
TOTAL ADDED	39.66	110.2
TOTAL LOAD ON MDP INCREASED AS A PART OF THIS RENOVATION.		

SHORT-CIRCUIT CALCULATIONS

FAULT POINT	PANEL/ TRANSFORMER	SOURCE FAULT POINT	SOURCE I _{sc}	CONDUIT TYPE	CONDUCTOR MATERIAL	CONDUCTOR OR BUS SIZE	'C' VALUE	E (V)	L (FT)	XFMR kVA	XFMR %Z	f	M	I _{sc}
1	UTILITY XFMR							208		300	1.6			52,046
2	MDP - EXISTING	1	52,046			3 SETS OF 600 KCMIL	23451	208	25.0			0.154	0.87	45,101
3	LP-F - NEW	2	45,101			1 SET OF 3/0	9110	208	255.0			10.512	0.09	3,918

THE FOLLOWING THREE PHASE CALCULATIONS ARE BASED ON THE "POINT-BY-POINT" METHOD WHERE:

$$I_{sc} = I_{sc} \times M$$

$$M = 1 / (1 + f)$$

CONDUCTOR OR BUS: $f = 1.732 \times L \times I_{sc} / C \times n \times E$

UTILITY XFMR: $I_{sc} = KVA \times 100,000 / E \times 1.732 \times \%Z$

XFMR: $f = (I_{sc}) \times E_p \times 1.73 \times \%Z / 100,000 \times KVA$

$I_{sc} = E_p \times M \times I_p(sc) / E_s$

L = LENGTH (ft) OF CONDUCTOR, C = CONSTANT FROM TABLE, n = NUMBER OF CONDUCTORS PER PHASE
 I_{sc} = AVAILABLE SHORT CIRCUIT (A), E = VOLTAGE OF CIRCUIT

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DIAGRAM GENERAL NOTES:

- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS, COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE "FEEDER AND BRANCH CIRCUIT SIZING SCHEDULE-GENERAL PURPOSE" ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
- MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH THE MOTOR CIRCUIT SIZING SCHEDULES ON THE "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS SPECIFICALLY NOTED OTHERWISE.
- BASIS OF DESIGN IS SIEMENS DISTRIBUTION EQUIPMENT. IF THE CONTRACTOR ELECTS TO PROVIDE EQUIPMENT FROM OTHER APPROVED MANUFACTURERS, THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THE LAYOUT AND CLEARANCE REQUIREMENTS IN ALL SPACES CONTAINING ELECTRICAL EQUIPMENT AND PROVIDE EQUIPMENT MEETING THE SPECIFICATIONS AND ACHIEVING CODE REQUIRED CLEARANCES WITHIN THE SPACE PROVIDED.
- SELECTIVE COORDINATION (PER NEC ARTICLES 517.31(G), 700.32 AND 701.27) IS BASED ON SIEMENS DISTRIBUTION EQUIPMENT. ELECTRICAL CONTRACTOR SHALL SUBMIT SELECTIVE COORDINATION STUDY WITH TIME CURRENT CHARACTERISTIC CURVES (AND TABLES FOR TESTED PAIR INSTANTANEOUS COORDINATION) FOR THE EMERGENCY SYSTEMS. ELECTRICAL CONTRACTORS SHALL RECEIVE APPROVED SHOP DRAWINGS BACK FROM ENGINEER OF RECORD PRIOR TO PURCHASING OR INSTALLING ANY ELECTRICAL DISTRIBUTION EQUIPMENT. BREAKERS MUST BE COORDINATED WITH AUTOMATIC TRANSFER SWITCHES 3-CYCLE WITHSTAND RATING. ALTERNATE MANUFACTURERS SHALL MEET SELECTIVE COORDINATION CRITERIA AT NO ADDITIONAL COST TO THE PROJECT.
- VARIABLE FREQUENCY CONTROLLERS (VFC) FURNISHED BY MECHANICAL TRADES. ELECTRICAL CONTRACTOR SHALL INSTALL VFC, PROVIDE POWER FEEDER FROM DISTRIBUTION EQUIPMENT TO VFC AND PROVIDE POWER FEEDER FROM VFC TO MOTOR. REFER TO SPECIFICATIONS FOR APPLICATION OF VFC POWER CABLE FROM VFC TO MOTOR.

CONSTRUCTION KEY NOTES:

- POWER DISTRIBUTION EQUIPMENT (ONE LINE) IS EXISTING UNLESS OTHERWISE INDICATED.
- PROVIDE NEW PANEL AND FEEDER. FEED FROM EXISTING BREAKER. VERIFY EXISTING CONDITIONS IN FIELD. PROVIDE PANEL FEEDER OF 4/3"Ø & 1#6 GRD, IN 2 1/2" CONDUIT SIZED FOR VOLT DROP - VERIFY.
- METER THE MAIN DISTRIBUTION PANEL FOR LOAD FOR 30 DAYS PER NEC REQUIREMENTS TO VERIFY AVAILABLE CAPACITY.
- VERIFY LP-X IS OPERATIONAL. NOTIFY ENGINEER AND OWNERS REPRESENTATIVE IF OTHERWISE. DOCUMENT DETAILS OF CONNECTION TO POWER SOURCE AND SWITCH IN AS-BUILT DRAWINGS.



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FORBES
 Financial Administration

PROJECT: RENOVATE ARMORY WASHTEWAW ARMORY

DESIGNED: SWM

DRAWN: SWM

CHECKED: SWM

APPROVED: SWM

DATE: 04/01/2022

ISSUED FOR: CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER: PROJECT: WASHTEWAW ARMORY CONTRACT NUMBER: 121466 FILE NO. 511/21326.GAK

SHEET NUMBER: 92 OF 96

DRAWING TITLE: ONE LINE DIAGRAM

DRAWING NUMBER: E-501

DMA PROJECT NO. 263802016

EXISTING PANELBOARD PP-E

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	Spare			15						15		Spare		2
3	Spare			15						15		Spare		4
5	Spare			15						15		Spare		6
7	Spare			15						15		Spare		8
9	Spare			40						40		Spare		10
11	Spare			40						40		Spare		12
13	Spare			20						20		Spare		14
15	Spare			40						40		Spare		16
17	Spare			40						40		Spare		18
19	Spare			40						40		Spare		20
21	Spare			40						40		Spare		22
23	Spare			50						50		Spare		24
25	Spare			90						90		Spare		26
27	Spare			90						90		Spare		28
29	VAV-Controls			20						20		Spare		30
31	Spare			20						20		Spare		32
33	Spare			20						20		Spare		34
35	Spare			20						20		Spare		36
37	Spare			20						20		Spare		38
39	Spare			20						20		Spare		40
41	Spare			20						20		Spare		42

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 100A
MAIN TYPE: MLO
MINIMUM A.I.C.:
MOUNTING: SURFACE

BRANCH CIRCUIT CONNECTED LOAD
CONTINUOUS LOAD (C)
ELECTRIC HEAT (E)
NON-CONTINUOUS LOAD (NC)
KITCHEN LOAD (K)
RECEPTACLE BASE LOAD (R)
RECEPTACLE DEMAND LOAD (R)
LIGHTING LOAD (L)
ADDITIONAL TRACK LIGHTING LOAD
MOTORS, HIGHEST LOAD (MH)
MOTORS, REMAINING LOAD (M)

DEMAND FACTOR
100%
100%
100%
100%
50%
100%
100%
125%
100%

CALCULATED LOAD
656
656
1301
540
720
20
1279
360
800
800
800
540
444
444
2160
2160
2160

FEEDER AND OVERCURRENT SIZING
125%
125%
100%
100%
100%
100%
100%
125%
100%

NOTES:
TOTAL (KVA): 6.60
TOTAL (AMPS): 18

EXISTING REVISED PANELBOARD LP-C

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	(3) Recept.	Storage 128, Office 150		20						20		(3) Recept.	Recruiter 144A, 145, 147	2
3	(4) Recept.	Vault 127, Unit Storage 134		20			360		360	20		(4) Recept.	Admin 140 & NEW OFFICE	4
5	(1) Recept.	Vault 127		20						20		(1) Recept.	Admin 140, Commander 156	6
7	(4) Recept.	Training 152, Mens Locker 134		20						20		(2) Recept.	1st SGT 157, Admin 140	8
9	Physical Training	152		20						20		(3) Recept.	Admin 139, 1 SGT 159	10
11	Physical Training	153		20						20		(3) Work Stations;	Open Office 137	12
13	Physical Training	154		20						20		(3) Work Stations;	Open Office 137	14
15	Physical Training	155		20						20		Mens Toilet 133;	Mens Locker 134	16
17	Physical Training	156		20						20		Hand Dryer;	Mens Toilet 133	18
19	Physical Training	157		20						20		Womens Toilet 132		20
21	ACU-3			20						20		Hand Dryer;	Womens Toilet 132	22
23	ACR-3			20						20		Rooms 129, 129A, 130;	(4) Recept.	24
25	ACU-4			30						30		Electric Water Cooler		26
27	AC-4			30						30		SPARE		28
29	VF-2			20						20		FACP		30
31	CP-3			20		720			720	20		NEW DOOR CONTROL POWER SUPPLIES	NC	32
33	CP-4			20		720			720	20		NEW DOOR CONTROL POWER SUPPLIES	NC	34
35	SPARE			20						20	GFI	NEW RECEPTACLE - REFRIG - LAC RM	36	
37	SPARE			20						20		NEW BLOW DRYER - WOMENS LOCKER	M	40
39	M	NEW BLOW DRYER - WOMENS LOCKER		20	1200		2400		1200	20		NEW BLOW DRYER - WOMENS LOCKER	M	42
41	M	NEW BLOW DRYER - WOMENS LOCKER		20	1200		2400		1200	20		NEW BLOW DRYER - WOMENS LOCKER	M	42

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.: 22,000
MOUNTING: SURFACE

BRANCH CIRCUIT CONNECTED LOAD
CONTINUOUS LOAD (C)
ELECTRIC HEAT (E)
NON-CONTINUOUS LOAD (NC)
KITCHEN LOAD (K)
RECEPTACLE BASE LOAD (R)
RECEPTACLE DEMAND LOAD (R)
LIGHTING LOAD (L)
ADDITIONAL TRACK LIGHTING LOAD
MOTORS, HIGHEST LOAD (MH)
MOTORS, REMAINING LOAD (M)

DEMAND FACTOR
100%
100%
100%
100%
100%
50%
100%
125%
100%

CALCULATED LOAD
360
360
1440
360
360
500
1000
125%
4800

FEEDER AND OVERCURRENT SIZING
125%
125%
100%
100%
100%
100%
100%
125%
100%

NOTES:
TOTAL (KVA): 6.60
TOTAL (AMPS): 18

EXISTING REVISED PANELBOARD LP-A

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	Lts-Mech. Rm.	115,116		20						20		Spare		2
3	Lts-Unit Storage	124		20						20		Lts-Sarge. C.O. Rms		4
5	Lts-Administration			20						20		Lts-Administration		6
7	Lts-Administration			20						20		Lts-Administration		8
9	Lts-Administration			20						20		Lts-Admin. H.O. Admin		10
11	Recept.- Vault 125			20						20		Lts-Sarg. Conference		12
13	Spare			230					230	20		REV LIGHTS, CORRIDOR 128, STOR 129 NLA		14
15	REV LIGHTS, PES STORAGE 129			20	640		640			20		Spare		16
17	Fire Alarm Flow Switch			20						20		Recept.- Mech Rm, 2nd Fl		18
19	RC Pump-3,4			20						20		Spare		20
21	Unit Heaters; Storage			20						20		Recept. Vault 125		22
23	Dehumidifier; Vault 125			20						20		Recept. Rifle Range		24
25	Spare			20						20		Spare		26
27	Recept. Admin. 106			20						20		Recept.-BN, H.O. Admin		28
29	Recept. Roof			20						20		Recept. (Sarg.) W.H.O. Adm.		30
31	Recept. Conf and Co Rm			20						20		Rifle Range Heaters		32
33	VAV Control Panel			20						20		Recept. Admin. 108		34
35	Recept. Sarge 111			20						20		Recept. Admin. 106, 110		36
37	Recept. - Mech. Rm 114			20						20		Recept. - Admin. 108		38
39	Exhaust Fans			20						20		Recept.-Chair Storage		40
41	Unit Heaters B.N.H.Q Supply			20						20		Unit Heaters B.N.H.Q Supply		42

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 225A
MAIN TYPE: MLO
MINIMUM A.I.C.:
MOUNTING: SURFACE

BRANCH CIRCUIT CONNECTED LOAD
CONTINUOUS LOAD (C)
ELECTRIC HEAT (E)
NON-CONTINUOUS LOAD (NC)
KITCHEN LOAD (K)
RECEPTACLE BASE LOAD (R)
RECEPTACLE DEMAND LOAD (R)
LIGHTING LOAD (L)
ADDITIONAL TRACK LIGHTING LOAD
MOTORS, HIGHEST LOAD (MH)
MOTORS, REMAINING LOAD (M)

DEMAND FACTOR
100%
100%
100%
100%
100%
50%
100%
125%
100%

CALCULATED LOAD
230
640
230
20
20
1000
1000
125%
100%

FEEDER AND OVERCURRENT SIZING
125%
125%
100%
100%
100%
100%
100%
125%
100%

NOTES:
TOTAL (KVA): 6.60
TOTAL (AMPS): 18

NEW PANELBOARD LP-F

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	L	LIGHTS, PHYSICAL TRAINING 155		20	464	1120			656	15		VCU-2	M	2
3	L	LIGHTS, JANITOR 148, LACTATION 149		20	42		696		656	15		VCU-3	M	4
5	L	LIGHTS, CORRIDOR 158, VESTIBULE 154		20	605		1301		1096	15		VCU-9	M	6
7	L	LIGHTS, SUPPLY 160, OFFICE 161		20	791	1331			540	20		RECEPTABLES - SUPPLY CAGES	R	8
9	L	LIGHTS, VAULT 162		20	175		895		720	20		RECEPTABLES - SUPPLY OFFICE	R	10
11	L	LIGHTS, MENS SHOWER 146		20	137			857	720	20		DHMM-1	M	12
13	L	LIGHTS, WOMENS SHOWER 147		20	137	1217			1090	20		ACU-6/ACCU-6	M	14
15	SPARE			20			1279		1279	15		RECEPTABLES - CORRIDOR	R	16
17	SPARE			20		360			360	20		TREADMILL - PHYS FITNESS	M	18
19	SPARE			20		800			800	20		TREADMILL - PHYS FITNESS	M	20
21	SPARE			20		800			800	20		TREADMILL - PHYS FITNESS	M	22
23	SPARE			20		800			800	20		TREADMILL - PHYS FITNESS	M	24
25	SPARE			20		800			800	20		TREADMILL - PHYS FITNESS	M	26
27	SPARE			20		800			800	20		TREADMILL - PHYS FITNESS	M	28
29	SPARE			20		540	540		20			RECEPTABLES - PHYS FITNESS	R	30
31	SPARE			20		444			444	15		BCU-1	M	32
33	SPARE			20		444			444	15		BCU-1	M	34
35	SPARE			20		444			444	15		BCU-1	M	36
37	CP-6			15	528	2688			2160			ACCU-2 (ROOF)	MH	38
39	SPARE			20		2160			2160	30		ACCU-2 (ROOF)	MH	40
41	M	CLH-1		15	200	7960	7075	7581	2160	30		ACCU-2 (ROOF)	MH	42

PANELBOARD INFORMATION
VOLTAGE: 208Y/120
BUS AMPACITY: 125A
MAIN TYPE: MLO
MINIMUM A.I.C.: 10,000
MOUNTING: SURFACE

BRANCH CIRCUIT CONNECTED LOAD
CONTINUOUS LOAD (C)
ELECTRIC HEAT (E)
NON-CONTINUOUS LOAD (NC)
KITCHEN LOAD (K)
RECEPTACLE BASE LOAD (R)
RECEPTACLE DEMAND LOAD (R)
LIGHTING LOAD (L)
ADDITIONAL TRACK LIGHTING LOAD
MOTORS, HIGHEST LOAD (MH)
MOTORS, REMAINING LOAD (M)

DEMAND FACTOR
100%
100%
100%
100%
100%
50%
100%
125%
100%

CALCULATED LOAD
656
656
1301
540
720
20
1279
360
800
800
800
540
444
444
2160
2160
2160

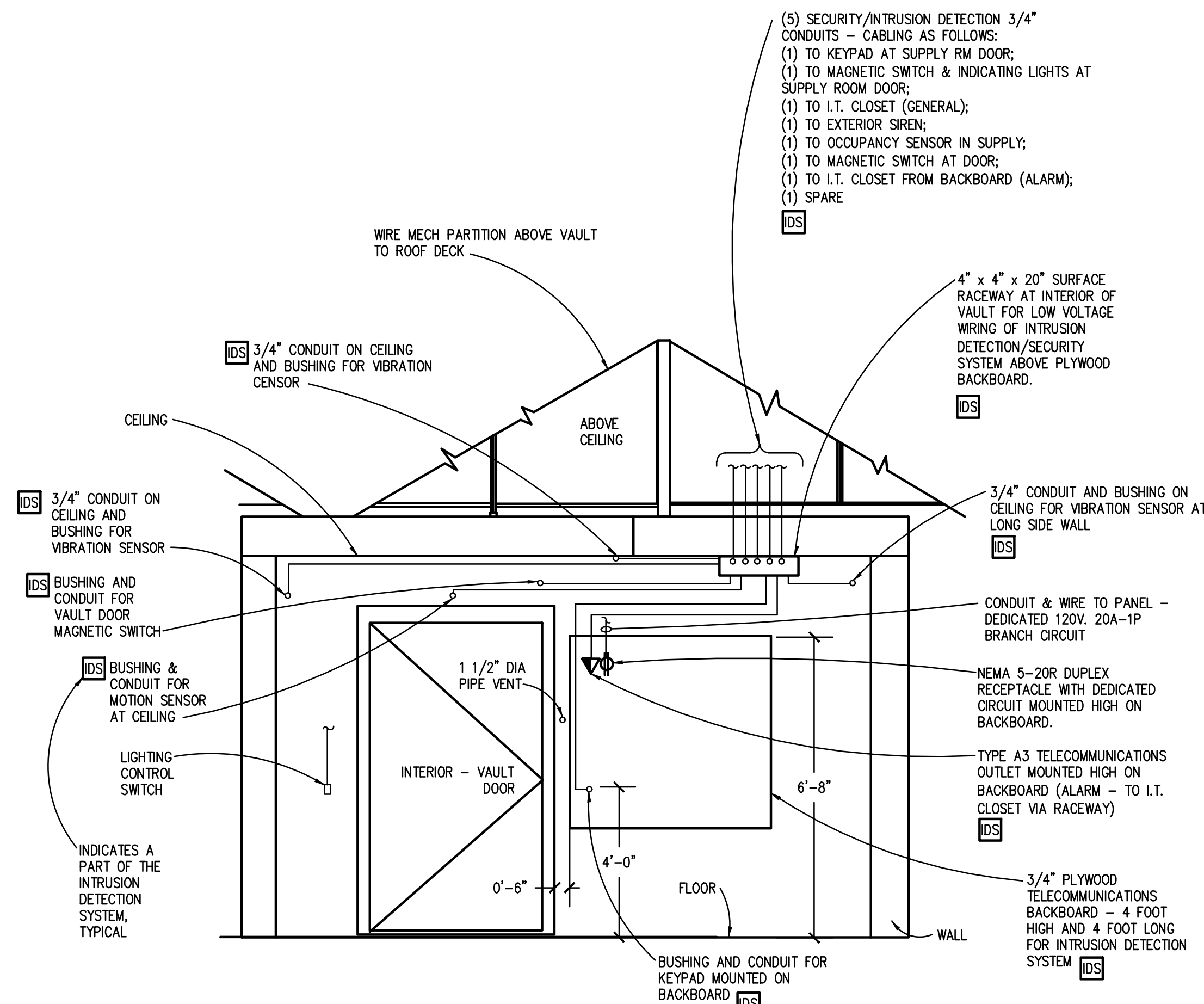
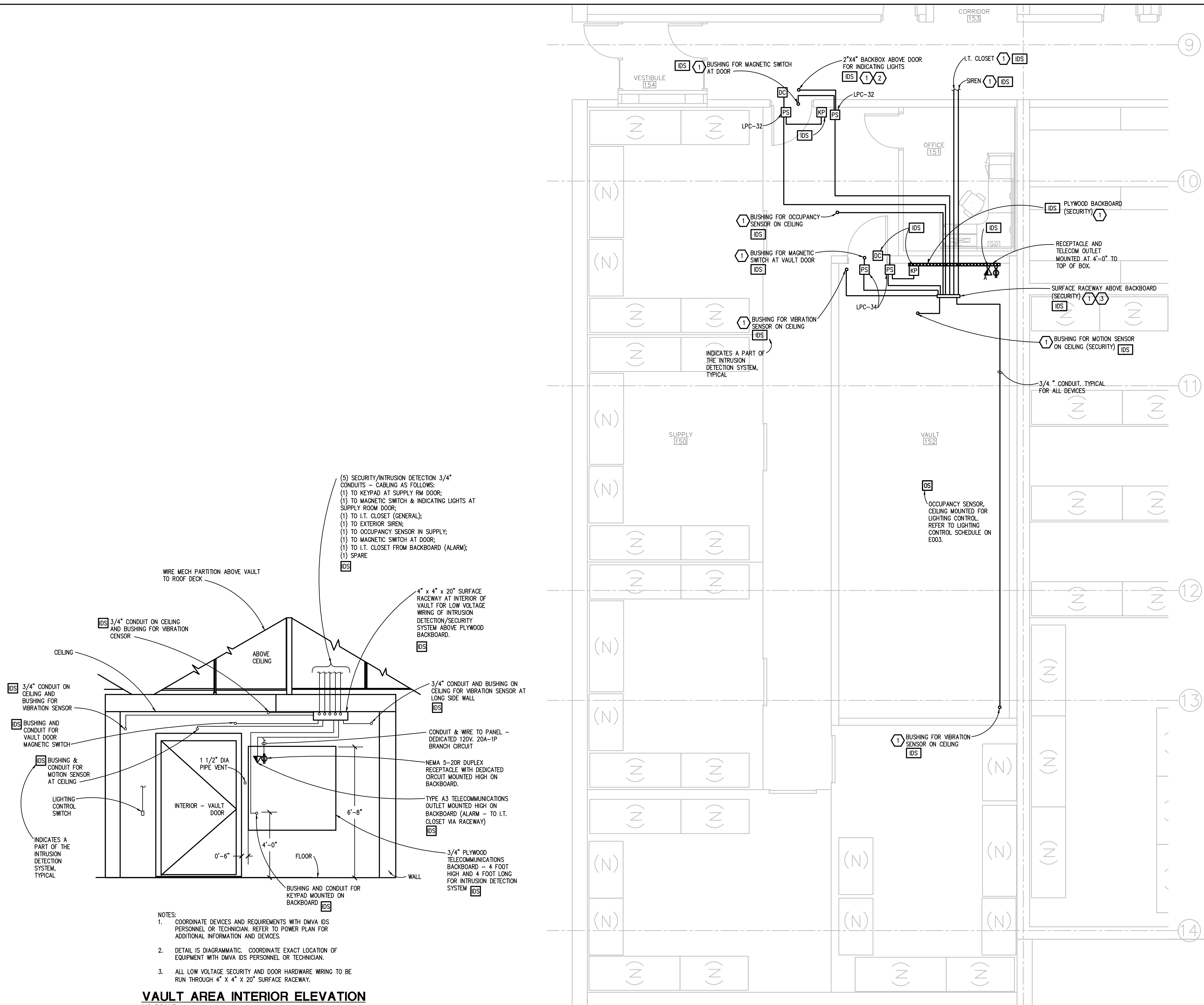
FEEDER AND OVERCURRENT SIZING
125%
125%
100%
100%
100%
100%
100%
125%
100%

NOTES:
TOTAL (KVA): 24.24
TOTAL (AMPS): 67

EXISTING REVISED PANELBOARD LP-D

#	LOAD TYPE	DESCRIPTION	CB TYPE	CB	VA	BA	BB	BC	VA	CB	CB TYPE	DESCRIPTION	LOAD TYPE	#
1	(2) Work Stations;	Admin 110		20						20		(2) Recept.	PES Storage 122	2
3	(2) Work Stations;	Admin 108, 110		20						20		UH-1, UH-2, UH-3, PES Storage 122	4	4
5	(6) Work Stations			20						20		(4) Recept.	Unit Storage 124, Vault 125	6
7	Health Protection	106A		20						20		(1) Recept.	Vault 125	8
9	(2) Recept.	Admin 106		20						20		(2) Recept.	Supply Office 149	10
11	(3) Recept.	Admin 108		20						20		(3) Recept.	Vault 125	12
13	(3) Recept.	BATT 154, 155		20						20		ACU-1		14
15	(3) Work Stations;	BATT 154, BATT 155		20						20		ACU-1		16
17	(2) Recept.	Entry 101 Counter		20						30		ACU-		

9: \2021\2021-0363-00\CAD\2021-0363-E6-EP.dwg, E-601, 3/25/2022 2:13:27 PM, Devin J. Senechal, Peter Basso Associates Inc.



- NOTES:
- COORDINATE DEVICES AND REQUIREMENTS WITH DMVA IDS PERSONNEL OR TECHNICIAN. REFER TO POWER PLAN FOR ADDITIONAL INFORMATION AND DEVICES.
 - DETAIL IS DIAGRAMMATIC. COORDINATE EXACT LOCATION OF EQUIPMENT WITH DMVA IDS PERSONNEL OR TECHNICIAN.
 - ALL LOW VOLTAGE SECURITY AND DOOR HARDWARE WIRING TO BE RUN THROUGH 4" X 4" X 20" SURFACE RACEWAY.

VAULT AREA INTERIOR ELEVATION
NO SCALE

THE FOLLOWING DIMENSION EQUALS ONE INCH WHEN PRINTED TO SCALE.

1
E-301

VAULT AREA - ENLARGED POWER AND AUXILIARY SYSTEMS PLAN
SCALE: 1/4" = 1' - 0"

ELECTRICAL GENERAL NOTES:

- THESE DRAWINGS REPRESENT THE GENERAL EXTENT AND ARRANGEMENT OF SYSTEMS, COORDINATE EXACT EQUIPMENT LOCATIONS, ELEVATIONS, AND FINAL CONNECTION REQUIREMENTS. PROVIDE EACH SYSTEM COMPLETE, INCLUDING ALL NECESSARY COMPONENTS, FITTINGS AND OFFSETS.
- INSTALL SYSTEMS SUCH THAT REQUIRED CLEARANCE AND SERVICE ACCESS SPACE IS PROVIDED AROUND ALL MECHANICAL AND ELECTRICAL EQUIPMENT, AND AROUND ANY COMPONENTS WHICH REQUIRE SERVICE ACCESS.
- COORDINATE AND PROVIDE ACCESS DOORS WITHIN INACCESSIBLE CEILING, SHAFT, AND CHASE AREAS FOR ALL COMPONENTS WHICH REQUIRE SERVICE ACCESS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
- PROVIDE SUPPLEMENTARY STEEL AS REQUIRED FOR THE PROPER SUPPORT OF ALL SYSTEMS.
- TRANSFORMER SECONDARY CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH TRANSFORMER CIRCUIT SIZING SCHEDULE SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
- MOTOR CIRCUIT PROTECTION SHALL BE SIZED IN ACCORDANCE WITH MOTOR CIRCUIT SIZING SCHEDULES SHOWN ON "ELECTRICAL STANDARD SCHEDULES DRAWING" UNLESS OTHERWISE NOTED.
- COORDINATE THE MOUNTING HEIGHTS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND THE TRADES INSTALLING THE WORK.
- COORDINATE EXACT LOCATIONS OF ALL FLOOR SERVICE FITTINGS AND POKE-THROUGH ASSEMBLIES WITH FINAL FURNITURE LAYOUT DRAWINGS.
- REFER TO MECHANICAL SCHEDULE SHEETS FOR ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT. PROVIDE ALL CONNECTIONS, STARTERS, DISCONNECTS, ETC. AS REQUIRED BY SCHEDULES AND WHERE NOTED ELSEWHERE. VERIFY REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH SHOP DRAWINGS SUBMITTALS. NOTIFY ENGINEER OF ANY CONFLICTS BETWEEN EQUIPMENT SUBMITTALS AND ELECTRICAL DRAWINGS. WHERE CIRCUIT SIZES ARE SHOWN ON THE ELECTRICAL DRAWINGS THAT DIFFER FROM WHAT IS INDICATED ON THE MECHANICAL SCHEDULES, PROVIDE THE CIRCUIT OF HIGHER AMPACITY.
- REFER TO TEMPERATURE CONTROLS SHEETS FOR REQUIRED FIRE ALARM CONTROL MODULES, DUCT SMOKE DETECTORS, AND MOTOR CONTROLLERS. PROVIDE ALL ACCESSORIES INDICATED.
- REFER TO LIGHTING CONTROL SCHEDULE FOR ROOM CONTROL AND EMERGENCY LIGHTING CIRCUIT CONTROL REQUIREMENTS. DESIGNATION FOR ROOM IS INDICATED AS A LETTERED OVAL SYMBOL.
- ALL FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH THE EXISTING FIRE ALARM SYSTEM. PROVIDE NECESSARY COMPONENTS, MODULES, ETC. AS REQUIRED FOR A FULLY FUNCTION SYSTEM. RE-TEST AND CERTIFY EXISTING FIRE ALARM SYSTEM AT THE COMPLETION OF THE PROJECT.
- HOLD A PRE-CONSTRUCTION/PRE-ROUGHING MEETING FOR WORK RELATED TO THE INTRUSION DETECTION SYSTEM (IDS). INCLUDE OWNER, GENERAL CONTRACTOR, ELECTRICAL SUBCONTRACTOR, DMVA IDS TECHNICIAN, AND OTHER PERSONNEL FOR COORDINATION OF SYSTEM REQUIREMENTS, INSTALLATION, AND OTHER RELATED WORK.

CONSTRUCTION KEY NOTES:

- SECURITY DEVICES AND ASSOCIATED WIRING SHALL BE PROVIDED BY DMVA IDS PERSONNEL OR TECHNICIAN. PROVIDE SECURITY SYSTEM CONDUIT, RACEWAYS, AND BUSHING TERMINATIONS AT APPROXIMATE LOCATIONS INDICATED. COORDINATE EXACT LOCATIONS AND REQUIREMENTS WITH DMVA IDS PERSONNEL OR TECHNICIAN. TELECOMMUNICATIONS, POWER, AND OTHER SYSTEMS BY ELECTRICAL CONTRACTOR. REFER TO E301 FOR ADDITIONAL REQUIREMENTS.
- PROVIDE BUSHING AND 3/4" CONDUIT RACEWAY BACK TO LOW VOLTAGE VAULT SURFACE RACEWAY.
- 4 INCH SQUARE X 24 INCH SURFACE RACEWAY MOUNTED ABOVE DOOR - FOR LOW VOLTAGE WIRING. ROUTE ALL LOW VOLTAGE CABLING FOR VAULT DEVICES THROUGH RACEWAY.
- REUSE EXISTING AREA CIRCUIT AND CONTROL WIRING. INDICATED CIRCUITS TAKEN FROM ORIGINAL DOCUMENTS. VERIFY IN FIELD.
- MOUNT ABOVE SHELF. REFER TO ARCHITECTURAL ELEVATIONS FOR DRYER LOCATIONS. COORDINATE EXACT DRYER CONNECTION MOUNTING HEIGHT WITH ARCHITECT.
- COORDINATE HAND DRYER CONNECTION MOUNTING HEIGHTS AND LOCATIONS WITH ARCHITECTURAL ELEVATIONS.
- TERMINATE TELECOMMUNICATIONS CABLING IN EXISTING I.T. ROOM. REFER TO SPECIFICATION SECTION 270500 VOICE AND DATA COMMUNICATION SYSTEMS.



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CONSULTING ENGINEERS

PROJECT	RENOVATE ARMORY WASHTEAW ARMORY
DESIGNED	SWM
DRAWN	CHECKED SWM
DATE	04/01/2022
ISSUED FOR	CONSTRUCTION DOCUMENTS
IDENTIFICATION NUMBER	PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: 121465 FILE NO. 511/21326.CAK DMVA PROJECT NO. 2483822016
SHEET NUMBER	94 OF 96
DRAWING TITLE	VAULT AREA - ENLARGED POWER AND AUXILIARY SYSTEMS PLAN

E-601

9:\2021\2021-0363-00\CAD\2021-0363-E7-DT.dwg, E-702 LIGHTING FIXTURE AND LIGHTING CONTROL SCHEDULES, 3/25/2022 2:13:34 PM, Devin J. Senechal, Peter Basso Associates Inc.

INTERIOR LIGHTING CONTROL SCHEDULE																		
PLAN REFERENCE	ROOM TYPE	LOCAL CONTROL			CONTROL ON / OFF	SENSOR TYPE	TURN ON LIGHTING TO %	BI-LEVEL CONTROL	DAYLIGHT			NO DETECTION PARTIAL OFF (NOTE 10)		NO DETECTION FULL OFF (MIN)	TIME-CLOCK SCHEDULE	EMERGENCY LIGHTING CIRCUIT CONTROL	CONTACT FOR HVAC CONTROL	NOTES
		SWITCH TYPE	SWITCH CONTROL	SCENE CONTROL					SIDE LIGHT	TOP LIGHT	MAINTAIN FC LEVEL	REDUCE TO (%)	AT(MIN)					
A	OFFICE (ENCLOSED AND ≤ 250 SQFT)	LINE VOLTAGE	ON-OFF-DIM	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	FULL 100%	CONTINUOUS DIM	NA	NA	NA	NA	NA	20	NA	NA	NA	
B	ELECTRICAL/MECHANICAL ROOM	LINE VOLTAGE	ON-OFF	NA	MANUAL ON / MANUAL OFF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
E	CORRIDOR (ALL OTHER CORRIDORS)	LINE VOLTAGE	ON-OFF	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	NA	NA	NA	NA	NA	NA	NA	20	NA	NA	NA	
H	LOBBY (ALL OTHER LOBBIES)	LINE VOLTAGE	ON-OFF	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
I	RESTROOM (ALL OTHER RESTROOMS)	LINE VOLTAGE	ON-OFF	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	NA	NA	NA	NA	NA	NA	NA	20	NA	NA	NA	
J	STORAGE ROOM (≥50 FT2 AND ≤ 1000 SQFT)	LINE VOLTAGE	ON-OFF	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	NA	NA	NA	NA	NA	NA	NA	20	NA	NA	NA	
K	STORAGE ROOM (ALL OTHER STORAGE ROOMS)	LINE VOLTAGE	ON-OFF	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	NA	NA	NA	NA	NA	NA	NA	20	NA	NA	NA	
L	GYMNASIUM/FITNESS CENTER (IN AN EXERCISE AREA)	LINE VOLTAGE	ON-OFF-DIM	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	NA	INTERMEDIATE STEP 70%	NA	NA	NA	NA	NA	20	NA	NA	NA	
O	LOCKER ROOM	LINE VOLTAGE	ON-OFF-DIM	NA	MANUAL ON / SENSOR OFF	DUAL TECHNOLOGY	NA	INTERMEDIATE STEP 70%	NA	NA	NA	NA	NA	20	NA	NA	NA	

NOTE:
 1. REFER TO PLANS FOR LOCATION OF LOCAL CONTROL.
 2. REFER TO PLANS FOR SCENE CONTROL.
 3. REFER TO PLANS FOR PRIMARY AND SECONDARY DAYLIGHT ZONES.
 4. PROVIDE EMERGENCY LIGHTING CIRCUIT CONTROL (BOELTS OR ALDR) PER SWITCHING CIRCUIT AS REQUIRED.
 5. CONTRACTOR SHALL PROVIDE FLOOR PLAN INDICATING SENSOR AND EQUIPMENT LOCATIONS OF CHOSEN CONTROL SYSTEM.
 6. REFER TO LUMINAIRE SCHEDULE FOR FIXTURE CHARACTERISTICS.
 7. LIGHTING SENSOR SHALL HAVE CONTACT FOR HVAC CONTROL WHEN A "YES" SELECTION IS MADE IN THE HVAC CONTROL COLUMN.
 8. REFER TO TEMPERATURE CONTROL DRAWINGS AND DIAGRAMS FOR ADDITIONAL SENSOR REQUIREMENTS.
 9. PROVIDE WIRING CONTROL DIAGRAM FOR APPLICABLE CONTROL SYSTEM(S).
 10. PERCENTAGE LIGHT OUTPUT REDUCTION IS FOR ALL FIXTURES WITHIN THE DESIGNATED ROOM UNLESS OTHERWISE NOTED.

NA = NOT APPLICABLE

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LUMINAIRE SCHEDULE							
TYPE	DESCRIPTION	MANUFACTURER(S)	WATTAGE	VOLTAGE	LIGHT CHARACTERISTICS	CONTROLS	REMARKS
L1	RECESSED 2'X4' LED FLAT PANEL	LITHONIA EPANL SERIES	29	MVOLT - 120-277	INTEGRAL LED, 3000L, 5000K, 80 CRI	0-10V 100%-1% DIMMING	
L2A	RECESSED 2'X4' LED WET LOCATION TROFFER	LITHONIA WRTL SERIES	21.5	MVOLT - 120-277	INTEGRAL LED, 3000L, 5000K, 80 CRI	0-10V 100%-1% DIMMING	
L2B	RECESSED 1'X4' LED WET LOCATION TROFFER	LITHONIA WRTL SERIES	21.5	MVOLT - 120-277	INTEGRAL LED, 3000L, 5000K, 80 CRI	0-10V 100%-1% DIMMING	
L3	RECESSED 1'X4' LED FLAT PANEL	LITHONIA EPANL SERIES	27	MVOLT - 120-277	INTEGRAL LED, 3000L, 5000K, 80 CRI	0-10V 100%-1% DIMMING	
L4A	SURFACE MTD DROP LENS VOLUMETRIC 4' LONG	LITHONIA STL4 SERIES	20	MVOLT - 120-277	INTEGRAL LED, 2000L, 5000K, 80 CRI	0-10V 100%-1% DIMMING	
L4B	SURFACE MTD DROP LENS VOLUMETRIC 4' LONG	LITHONIA STL4 SERIES	34.9	MVOLT - 120-277	INTEGRAL LED, 4000L, 5000K, 80 CRI	0-10V 100%-1% DIMMING	
L5	RECESSED 6 INCH DIA DOWNLIGHT	LITHONIA LD6 SERIES	13	MVOLT - 120-277	INTEGRAL LED, 500L, 750L, 1000L SWITCHABLE OPTIONS, 5000K, 80+ CRI	0-10V 100%-10% DIMMING	AT INSTALLATION, SET INITIAL LIGHT OUTPUT TO 750L OPTION.
R	EXISTING RECESSED 2'X4' FLUORESCENT TROFFER WITH RETROFIT LED LAMPS	LITHONIA G18 SERIES	64	MVOLT - 120-277	(2) RETROFIT LED LAMPS, APPROX. 2850L/LAMP, 5000K, 80+ CRI	ELECTRONIC PROGRAMMED RAPID START	ELECTRICAL CONTRACTOR/ FACILITIES TEAM TO SPECIFY & ORDER APPROPRIATE RETROFIT LED LAMPS
X	EXIT SIGN - GREEN LETTERING - UNIVERSAL MTC	SURE-LITES CX SERIES	1.09	MVOLT - 120-277	INTEGRAL LED, SELF POWERED		WALL-MOUNT AT 1'-0" ABOVE DOOR
OL1	EXTERIOR PARKING LOT FIXTURE WITH SQUARE POLE	LITHONIA D SERIES	89	MVOLT - 120-277	INTEGRAL LED, 11,600L, 5000K, 70+ CRI, P5 FORWARD OPTICS, TFM DISTRIBUTION		QUANTITY OF HEADS PER POLE AS INDICATED ON SITE PLAN; WITH PHOTOCELL OPTION; POLE HEIGHT = 30' AFG
OL2	EXTERIOR WALL MTD LUMINAIRE	LITHONIA WST LED SERIES	25	MVOLT - 120-277	INTEGRAL LED, 3500L, 5000K, P2 PERFORMANCE, VF DISTRIBUTION		WITH PHOTOCELL OPTION; MOUNT AT APPROX. 11'-6" (MATCH MOUNTING HEIGHT OF EXISTING WALL-MOUNTED LUMINAIRES.

GENERAL NOTES:
 1. REFER TO SPECIFICATIONS FOR DETAILED LIGHT FIXTURE CUT SHEETS.
 2. WATTAGE LISTED IS FROM THE BASIS OF DESIGN MANUFACTURER.
 3. FINISH TO BE APPROVED BY INTERIOR DESIGNER, ARCHITECT OR CLIENT.
 4. ALL LUMINAIRES TO BE AS SPECIFIED OR EQUAL APPROVED BY PBA.



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 Management Firm

PROJECT: RENOVATE ARMORY WASHTEAW ARMORY

DESIGNED: SWM CHECKED: SWM APPROVED: SAG

DATE: 04/01/2022

ISSUED FOR: CONSTRUCTION DOCUMENTS

IDENTIFICATION NUMBER: PROJECT: WASHTEAW ARMORY CONTRACT NUMBER: Y2146 FILE NO. 511/21326.CAK DWG PROJECT NO. 2483822016

SHEET NUMBER: 96 OF 96

DRAWING TITLE: LIGHTING FIXTURE AND LIGHTING CONTROL SCHEDULES

DRAWING NUMBER: **E-702**